

United States Environmental Protection Agency  
Washington, DC 20460

## Completion Form For Injection Wells

## Administrative Information

1. Permittee Florence Copper Inc.	
Address (Permanent Mailing Address) (Street, City, and ZIP Code) 1575 W Hunt Hwy, Florence, AZ 85132	
2. Operator Florence Copper Inc.	
Address (Street, City, State and ZIP Code) 1575 W Hunt Hwy, Florence, AZ 85132	
3. Facility Name Florence Copper Inc.	Telephone Number (520) 374-3984
Address (Street, City, State and ZIP Code) 1575 W Hunt Hwy, Florence, AZ 85132	
4. Surface Location Description of Injection Well(s)	
State Arizona	County Pinal
Surface Location Description Nw 1/4 of SW 1/4 of NE 1/4 of SW 1/4 of Section 28 Township 4S Range 9E	
Locate well in two directions from nearest lines of quarter section and drilling unit	
Surface Location 940 ft. from (N/S) N Line of quarter section and 1120 ft. from (E/W) E Line of quarter section.	
Well Activity <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input checked="" type="checkbox"/> Class III <input type="checkbox"/> Other	Well Status <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Modification/Conversion <input type="checkbox"/> Proposed
Type of Permit <input type="checkbox"/> Individual <input checked="" type="checkbox"/> Area : Number of Wells 33	
Lease Number NA	Well Number O-07

Submit with this Completion Form the attachments listed in Attachments for Completion Form.

## Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print) Ian Ream, Senior Hydrogeologist	Signature 	Date Signed 9-12-2018
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## PAPERWORK REDUCTION ACT

The public reporting and record keeping burden for this collection of information is estimated to average 49 hours per response for a Class I hazardous facility, and 47 hours per response for a Class I non-hazardous facility. Burden means the total time, effort, or financial resource expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

### Attachments to be submitted with the Completion report:

#### I. Geologic Information

##### 1. Lithology and Stratigraphy

A. Provide a geologic description of the rock units penetrated by name, age, depth, thickness, and lithology of each rock unit penetrated.

B. Provide a description of the injection unit.

- (1) Name
- (2) Depth (drilled)
- (3) Thickness
- (4) Formation fluid pressure
- (5) Age of unit
- (6) Porosity (avg.)
- (7) Permeability
- (8) Bottom hole temperature
- (9) Lithology
- (10) Bottom hold pressure
- (11) Fracture pressure

C. Provide chemical characteristics of formation fluid (attach chemical analysis).

D. Provide a description of freshwater aquifers.

- (1) Depth to base of fresh water (less than 10,000 mg/l TDS).
- (2) Provide a geologic description of aquifer units with name, age, depth, thickness, lithology, and average total dissolved solids.

#### II. Well Design and Construction

1. Provide data on surface, intermediate, and long string casing and tubing. Data must include material, size, weight, grade, and depth set.
2. Provide data on the well cement, such as type/class, additives, amount, and method of emplacement.
3. Provide packer data on the packer (if used) such as type, name and model, setting depth, and type of annular fluid used.

4. Provide data on centralizers to include number, type and depth.

5. Provide data on bottom hole completions.

6. Provide data on well stimulation used.

#### III. Description of Surface Equipment

1. Provide data and a sketch of holding tanks, flow lines, filters, and injection pump.

#### IV. Monitoring Systems

1. Provide data on recording and nonrecording injection pressure gauges, casing-tubing annulus pressure gauges, injection rate meters, temperature meters, and other meters or gauges.

2. Provide data on constructed monitor wells such as location, depth, casing diameter, method of cementing, etc.

#### V. Logging and Testing Results

Provide a descriptive report interpreting the results of geophysical logs and other tests. Include a description and data on deviation checks run during drilling.

VI. Provide an as-built diagrammatic sketch of the injection well(s) showing casing, cement, tubing, packer, etc., with proper setting depths. The sketch should include well head and gauges.

VII. Provide data demonstrating mechanical integrity pursuant to 40 CFR 146.08.

VIII. Report on the compatibility of injected wastes with fluids and minerals in both the injection zone and the confining zone.

IX. Report the status of corrective action on defective wells in the area of review.

X. Include the anticipated maximum pressure and flow rate at which injection will operate.

**TECHNICAL MEMORANDUM**

14 September 2018  
File No. 129687-010

TO: Florence Copper Inc.  
Ian Ream, Senior Hydrogeologist

FROM: Haley & Aldrich, Inc.  
Lauren Candreva, R.G.

Subject: Drilling, Installation, and Integrity Testing Summary  
PTF Observation Well O-07  
Florence Copper Inc., Florence, Arizona



This document describes drilling, installation, and testing of the Production Test Facility (PTF) observation well O-07 for Florence Copper Inc. (Florence Copper) in Florence, Arizona, including a description of the equipment used to perform the work, details of the completed work, and the results of well testing activities. Separate well completion reports have been created for each PTF well.

The Arizona Department of Water Resources Registry ID for well O-07 is 55-227236; the Well Registry Report is included in Appendix A. Well O-07 is located in the southeast quarter of the northwest quarter of the southwest quarter of Section 28 of Township 4 north, Range 9 East of the Gila and Salt River Baseline and Meridian (D(4-9)28CBD). Well O-07 is within the Underground Injection Control (UIC) Permitted Area of Review (AOR) for UIC Permit R9UIC-AZ3-FY11-1 and was completed as a Class III observation well for the PTF (Figure 1).

Florence Copper contracted National Exploration, Wells, & Pumps (National) to drill, install, and test well O-07 in accordance with *Bid Specification: Drilling, Installation, and Testing of Class III Observation Wells, Production Test Facility, Florence, Arizona* (Haley & Aldrich, Inc. [Haley & Aldrich], 2017). A Schramm T685WS drilling rig was used for all drilling and construction activities. Haley & Aldrich provided oversight of drilling activities, geophysical logging, well installation, and testing. All reported depths are in feet below ground surface unless otherwise noted.

## I. Geologic Information

### 1. Lithology and Stratigraphy

#### A. Geology of Penetrated Units

The geology penetrated during the drilling of the Class III well O-07 is summarized in the table below and a lithologic log is included in Appendix B.

Lithologic Unit Name	Depth to Bottom of Unit (feet)	Thickness of Unit (feet)	Lithology and Age of Unit
Upper Basin Fill Unit (UBFU)	284	284	Alluvium; Quaternary to Tertiary
Middle Fine-Grained Unit (MFGU)	301	17	Alluvium; Tertiary
Lower Basin Fill Unit (LBFU)	380	79	Alluvium; Tertiary to Cretaceous
Bedrock Oxide Unit (Oxide)	Not encountered	>830	Igneous porphyry – Precambrian

#### B. Description of Injection Unit

Name	Bedrock Oxide Unit
Depth Drilled	1,210 feet
Thickness	>830 feet
Formation Fluid Pressure	Atmospheric plus head of freshwater – no additional formation pressure
Age of Unit	Precambrian with intrusions of Precambrian to Tertiary rocks
Porosity <sup>1</sup>	Approximately 6 to 8.5%
Permeability	Hydraulic Conductivity = 0.56 feet per day
Bottom Hole Temperature	30.9 degrees Celsius
Lithology	Igneous porphyry – quartz monzonite, granodiorite with diabase and andesite dykes (detailed log included in Appendix B)
Bottom Hole Pressure	Approximately 430 pounds per square inch (PSI) (pressure exerted by the column of freshwater with no additional contribution from formation pressure)
Fracture Pressure	0.65 PSI per foot
<sup>1</sup> Porosity values for the bedrock oxide unit are approximate values from calculated neutron porosity values from injection well borehole surveys.	

### C. Chemical Characteristics of Formation Fluid

The chemical characteristics of the formation fluid in the injection zone are summarized below and the results of the sampling of the center PTF wellfield well R-09. The table below summarizes the primary chemical characteristics detected in a formation fluid sample collected on 23 April 2018. The complete analytical report is included in Appendix C.

Analyte	Result (mg/L)
<b>Metals</b>	
Aluminum	<0.08
Antimony	<0.005
Arsenic	0.0016
Barium	0.071
Beryllium	<0.0005
Cadmium	<0.00025
Calcium	140
Chromium	0.0051
Cobalt	<0.00025
Copper	0.011
Iron	<0.30
Lead	<0.0005
Magnesium	27
Manganese	0.002
Mercury	<0.001
Nickel	0.0033
Potassium	6.8
Selenium	<0.0025
Sodium	170
Thallium	<0.0005
Zinc	<0.04
<b>Anions</b>	
Bicarbonate	150
Chloride	310
Fluoride	<0.5
Nitrate	8.8
Sulfate	190
<b>Field Parameters</b>	
Total Dissolved Solids	1,000
pH	7.8
<b>Radiochemicals</b>	
Uranium	0.016
<b>Notes:</b> mg/L = milligrams per liter	

Results of the sampling of well O-07 are included in the *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings* (Brown and Caldwell, 2018).

#### D. Description of Freshwater Aquifers

- 1) The depth to the base of the freshwater aquifer is defined by the interface where deeper formation fluid exhibits a total dissolved solids (TDS) value of 10,000 milligrams per liter (mg/L). The depth of the 10,000 mg/L interface is deeper than all of the wells drilled at the site and consequently has not been defined.
- 2) The geologic description of the aquifer units is included below:

Aquifer Unit Name	Age	Depth (feet)	Thickness (feet)	Lithology	Average Total Dissolved Solids <sup>1</sup> (mg/L)
UBFU	Quaternary/Tertiary	0 to 284	284	Alluvium	914
LBFU	Tertiary	301 to 380	79	Alluvium	754

<sup>1</sup> Average TDS values calculated from UBFU and LBFU monitoring well ambient monitoring results near the PTF.

## II. Well Design and Construction

### 1. Well O-07 Casing Installed:

Casing	Material	Diameter (inches)	Weight (pounds per foot)	Depths (feet)	Borehole Diameter (inches)	Drilling Method
Surface	Mild Steel	14 O.D. 13 $\frac{3}{8}$ I.D.	47.36	0 to 40	24	Solid-stem auger
Well Casing	Fiberglass Reinforced Plastic	5.47 O.D. 4.74 I.D.	5.40	-1.0 to 446	12 $\frac{1}{4}$	Reverse Flooded Rotary
Screen	PVC SCH80 with 0.020-inch wide slots	5.56 O.D. 4.81 I.D.	4.08	446 to 1,198	12 $\frac{1}{4}$	Reverse Flooded Rotary

**Notes:**  
*I.D. = inside diameter*  
*O.D. = outside diameter*  
*PVC = polyvinyl chloride*  
*SCH = Schedule*

2. Well Cement

Cement Interval	Cement Type	Additives	Amount Installed (cubic yards)	Method of Emplacement
Surface Casing	Type V Neat 21 sack slurry	None	7 <sup>1</sup>	Submerged tremie
Well Casing	Type V Neat 21 sack slurry	None	11.5	Submerged Tremie
<sup>1</sup> Surface casing cement mixed by drilling contractor, volume estimated.				

Field forms documenting pipe tallies, annular materials, and cement tickets are included in Appendix D.

3. Annular Packers

No annular packers were used during construction of well O-07.

4. Centralizers

Casing	Centralizer Type	Number and Spacing
Well – FRP and PVC	Stainless steel – Heavy Duty	27 installed – every 40 feet
<b>Notes:</b> FRP = fiberglass reinforced plastic PVC = polyvinyl chloride		

5. Bottom Hole Completion

There is no bottom hole completion as this is not an oil/gas well. The well was completed at the bottom with a stainless-steel endcap of the same diameter as the well screen.

6. Well Stimulation

No well stimulation was used during the drilling and construction of well O-07.

### III. Description of Surface Equipment

1. Surface Equipment

Well O-07 is an observation well and has been equipped with a pressure transducer for monitoring water level and a low-flow pump for collecting fluid samples for analysis of specific conductance. A diagram of the wellhead is included in the well as-built in Figure 2.

## IV. Monitoring Systems

### 1. Well Monitoring Equipment

Equipment Type	Location	Type	Purpose
Pressure Transducer	Well Casing	Recording	Monitor water column/pressure
Electrical Conductivity Sensors	Well Annulus	Non-recording	Monitor formation conductivity
Annular Conductivity Sensors	Well Annulus	Non-recording	Monitor formation conductivity

### 2. Monitoring Wells

There are a total of 16 monitoring wells associated with the PTF: 7 point-of-compliance (POC) wells, 7 United States Environmental Protection Agency (USEPA) supplemental monitoring wells, and 2 operational monitoring wells. The POC wells are located outside the AOR and are not constructed as Class III wells. The supplemental monitoring and operational monitoring wells are located within the AOR and are constructed as Class III wells as required by the UIC Permit. The wells are summarized in the tables below by type.

POC Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M14-GL	846750.23 746461.52	859	5 9/16 OD	Submerged tremie	778 to 838	LBFU
M15-GU	846697.17 746464.82	615	5 9/16 OD	Submerged tremie	554 to 594	LBFU
M22-O	846751.26 746514.47	1,140	5 9/16 OD to 528 feet; 4½ OD to 1,140 feet	Submerged tremie	932 to 1,130	Oxide
M23-UBF	846688.13 746512.48	250	6¾ OD	Submerged tremie	210 to 250	UBFU
M52-UBF	851092.00 774178.00	274	5 9/16	Submerged tremie	198 to 273	UBFU
M54-LBF	847331.96 746682.61	630	5 9/16	Submerged tremie	310 to 629	LBFU
M54-O	847342.99 746702.36	1,199	5 9/16	Submerged tremie	668 to 1,198	Oxide

Supplemental Monitoring Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M55-UBF	847541.46 746280.63	261	5	Submerged tremie	240 to 260	UBFU
M56-LBF	847518.70 746303.41	340	5	Submerged tremie	320 to 340	LBFU
M57-O	847378.37 746248.93	1,200	5	Submerged tremie	523 to 1,199	Oxide
M58-O	847672.23 746595.97	1,200	5	Submerged tremie	594 to 1,199	Oxide
M59-O	847934.95 746218.89	1,201	5	Submerged tremie	534 to 1,199	Oxide
M60-O	847599.37 745903.70	1,201	5	Submerged tremie	444 to 1,200	Oxide
M61-LBF	848184.46 746148.88	629	5	Submerged tremie	429 to 629	LBFU

Operational Monitoring Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
MW-01-LBF	847487.97 746360.54	444	5	Submerged tremie	330 to 440	LBFU
MW-01-O	847499.04 746369.31	1,200	5	Submerged tremie	500 to 1,200	Oxide

## V. Logging and Testing Results

Borehole geophysical logging was conducted on well O-07 in two phases: 1) open-hole surveys in the 12.25-inch borehole prior to installation of the well casing and screen, and 2) cased-hole surveys in the completed well.

The open-hole geophysical surveys completed at well O-07 included:

- Spontaneous potential;
- Natural gamma;

- Electrical resistivity (short and long normal);
- Caliper with calculated volume;
- Temperature;
- Sonic; and
- Deviation.

The cased-hole geophysical surveys completed included:

- Sonic (for cement bond with fiberglass reinforced plastic [FRP]);
- 4 Pi Density (for cement bond with FRP);
- Dual Density (for cement bond with FRP); and
- Video Survey.

Open-hole geophysical surveys were used to support identification of the lithologic contacts, to evaluate the condition of the borehole, and to evaluate the deviation of the borehole.

The primary logs used to evaluate lithologic contacts are natural gamma ray, short (16-inch) and long (64-inch) normal electrical resistance, and single-point resistance. The lithologic contacts for the Middle Fine-Grained Unit (MFGU) were selected based on the short and long resistance and the single-point resistance. All the resistivity logs decreased and stayed consistently low through the MFGU. This contact is generally a relatively sharp decrease in resistance at the top of the unit and a gradual increase in resistance below the bottom of the unit.

The contact between the Lower Basin Fill Unit (LBFU) and the bedrock was identified primarily with natural gamma and correlated with the resistance logs. There is a consistent increase in gamma at the contact between the LBFU and the bedrock that had been identified and documented at the site during exploration in the 1990s. For well O-07, the gamma is consistently at approximately 70 American Petroleum Institute (API) units throughout the Upper Basin Fill Unit (UBFU) and MFGU, a slight increase to approximately 80 API units in the LBFU, and an increase at 385 feet up to 200 API units. After the increase at 385 feet, the natural gamma begins to vary significantly more than it did in the alluvial units. This change in the response of the natural gamma indicates the contact with the bedrock unit. Also, at this approximate depth there is an increase in the single-point resistance and the short normal resistance, indicating the formation has become more resistant. This is likely primarily due to the bedrock containing less water than the alluvial formation above.

Cased-hole geophysical surveys were conducted to evaluate the cement seal, the casing-cement bond, to document baseline fluid temperature and conductivity, and to evaluate the plumbness of the well. The cement-bond is discussed in Section VII.

Copies of all the open-hole geophysical logs are included in Appendix E; a figure summarizing the open-hole logs used to evaluate geology is included as Figure 3. The cased-hole logs used to evaluate cement bond are included in Appendix F.

## **VI. Well As-Built Diagram**

An as-built diagram for well O-07 is included as Figure 2.

## **VII. Demonstration of Mechanical Integrity**

A demonstration of Part I mechanical integrity of the well was completed using a standard annular pressure test (SAPT) in accordance with Part II.E.3.a.i.A of the UIC Permit. Mechanical integrity will be demonstrated every 2 years during operations and will be confirmed by daily injection pressure monitoring that will be conducted per the UIC Permit once the well is operational. Well O-07 SAPT is summarized below.

The mechanical integrity of the blank well casing was tested by performing a SAPT on 28 June 2017. The SAPT was conducted by installing an inflatable packer in the well secured with a threaded well seal at the surface. The packer was installed near the bottom of the FRP-cased portion of the well and the wellhead was equipped with a water-tight threaded wellhead. The packer was inflated to form a seal against the casing. The bottom 5 feet of the packer drop pipe was perforated to allow for communication between the tubing and the annulus of the packer assembly. The drop pipe extended through the wellhead and a high pressure/low volume pump was attached to the drop pipe to pressurize the test interval. A valve on the drop pipe at the surface was used to isolate the test interval once the planned test pressure was achieved.

An In-Situ LevelTROLL® pressure transducer with a data logger was installed at the well head and was connected to the packer assembly annulus interval via a National Pipe Thread adapter. The LevelTROLL was used to monitor and record pressure inside the well during the SAPT. To conduct the SAPT, water was pumped from a nearby well immediately prior to testing. Before the water was pumped into the test well, the water temperature was measured to ensure that it was similar to the ambient groundwater temperature of the test well to reduce the potential of differential temperature effects on the well casing. The SAPT for the Class III well was conducted by applying hydraulic pressure to the well casing and shutting in pressure between the packer and wellhead assembly, monitoring the shut-in pressure for a 30-minute period, then measuring the volume of water returned from the well casing after the pressure was released.

On 28 June 2017, the packer was installed to approximately 420 feet and the SAPT was conducted successfully two times. The USEPA SAPT form, a table of the data, and a chart of the data is provided in Appendix G.

Part II mechanical integrity is demonstrated by the cementing records included in this report in accordance with Part II.E.3.ii.C of the UIC Permit and will be demonstrated during operations by annular conductivity monitoring on the observation and multi-level sampling wells in accordance with Part II.E.3.a.ii.A of the UIC Permit.

Cemented Interval	Cement Type	Calculated Grout Volume (cubic yards)	Installed Grout Volume (cubic yards)
Surface Casing	Type V 21 sack neat cement slurry	3.1	7
Well Casing	Type V 21 sack neat cement slurry	13.4	11.5

On 5 June 2017, a suite of geophysical logs was run over the entire length of the completed well to verify the grout seal. A summary of the logs completed to demonstrate cement bond are included in Appendix F.

There is not a bond log tool designed to evaluate cement bond with FRP casing, so the cement interval with FRP casing of well O-07 was evaluated using density logs. The logs collected included sonic, focused density, and 4pi density. Based on the measured density of the FRP cased interval of well O-07, no significant cement deficiencies were noted in the sonic data collected from approximately 259 feet (static water level) to 426 feet, and no significant deficiencies were noted in the 4pi density data collected from 40 to 426 feet. There were some very localized, low density intervals identified in the 4pi density logs but they were insignificant, only extending 2 to 3 feet. A summary of the FRP cased data is included in the well completion summary in Appendix F.

## VIII. Compatibility of Injected Waste

The Florence Copper Project is a Class III mineral extraction project and does not include the injection of any waste products of any kind. The injected fluid (lixiviant) is a carefully constituted in-situ copper recovery solution that will be recovered and recycled following injection.

The compatibility of the lixiviant was evaluated as part of the geochemical modeling completed by Florence Copper and summarized in the *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona* (Daniel B. Stephens Inc., 2014) which was included in Attachment H of the UIC Permit Application.

## IX. Status of Corrective Action on Defective Wells in the Area of Review

There are not currently any defective wells in the AOR.

## X. Maximum Pressures and Flow Rates for O-07

Maximum Operating Pressure	Maximum Flow
Atmospheric	Not applicable – observation well

This well is an observation well used to monitor hydraulic control of the PTF. No fluids will be injected and only fluid to measure specific conductivity will be extracted using the installed low-flow pump.

## XI. Well Development

Well O-07 was developed by the airlift method, followed by pumping, and was completed by National using a workover rig. To purge drilling fluids and solids, on 24 May 2017 an airline was temporarily installed to approximately 1,180 feet and airlift development of the well was conducted at approximately 70 gallons per minute (gpm) to purge drilling fluids and solids from the well. During airlift development, the airlift pump was turned on and off to surge the well. Airlift development was conducted for approximately 13 hours; after 7 hours, approximately 2 gallons of AquaClear PFD® polymer dispersant was swabbed into the screened interval of the well. The discharge was clear and sand-free at the end of the airlift development period.

To pump develop the well, a submersible pump was temporarily installed to approximately 1,195 feet on 27 May 2017. Prior to pumping, the static water level was approximately 229 feet. The pump development was conducted at approximately 17 gpm; the submersible pump was periodically turned off to surge the well during development. The discharge was sand-free and visually clear after approximately 2.5 hours of pump development; however, development was continued for 17.5 hours. The development was concluded on 1 June 2017, at which time the discharge was sand-free with turbidity values less than 5 Nephelometric Turbidity Units. Well development forms are included in Appendix H.

## XII. Well Completion

A well video survey was conducted on 5 June 2017. The video log report is included as Appendix I. The video log depths are presented in feet below the top of the casing and so vary slightly from what is recorded but with the correction for stick up are the same.

The video log indicates the top of fill in the well is at 1,194 feet.

The surveyed location for well O-07 is:

Northing (feet)	Easting (feet)	Measuring Point Elevation (feet amsl)
746270.61	847623.88	1479.01
<b>Notes:</b> <i>Northing and easting locations provided in State Plane North American Datum 1983, vertical location provided in North American Vertical Datum 1988. amsl – feet above mean sea level</i>		

### **XIII. Downhole Equipment**

The equipment installed in well O-07 includes:

- QED® low-flow sampling pump hung on drop tubing – pump at 600 feet; and
- Pressure transducer.

The type and depth of equipment installed in each well is not constrained by the UIC Permit or the Aquifer Protection Permit (APP). This information is provided in accordance with Section 2.7.4.3 of the APP. Operational consideration may require that the type and depth of equipment may need to be changed in response to conditions observed during operations.

### **XIV. References**

Brown and Caldwell, Inc., 2018. *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings*. September.

Daniel B. Stephens, Inc., 2014. *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona*. May.

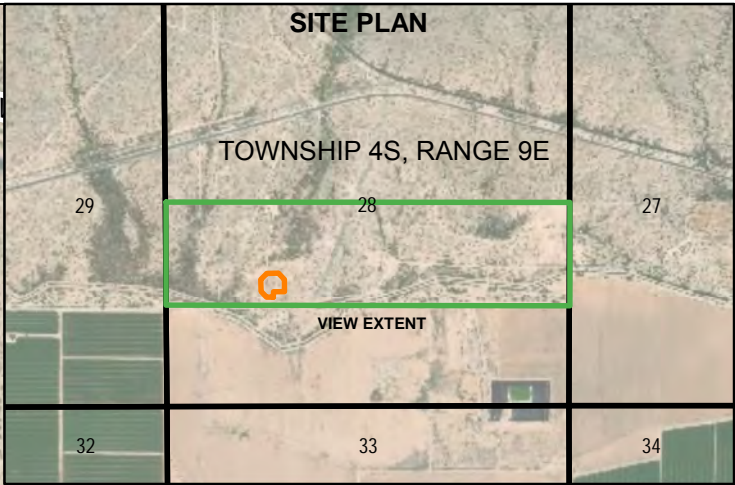
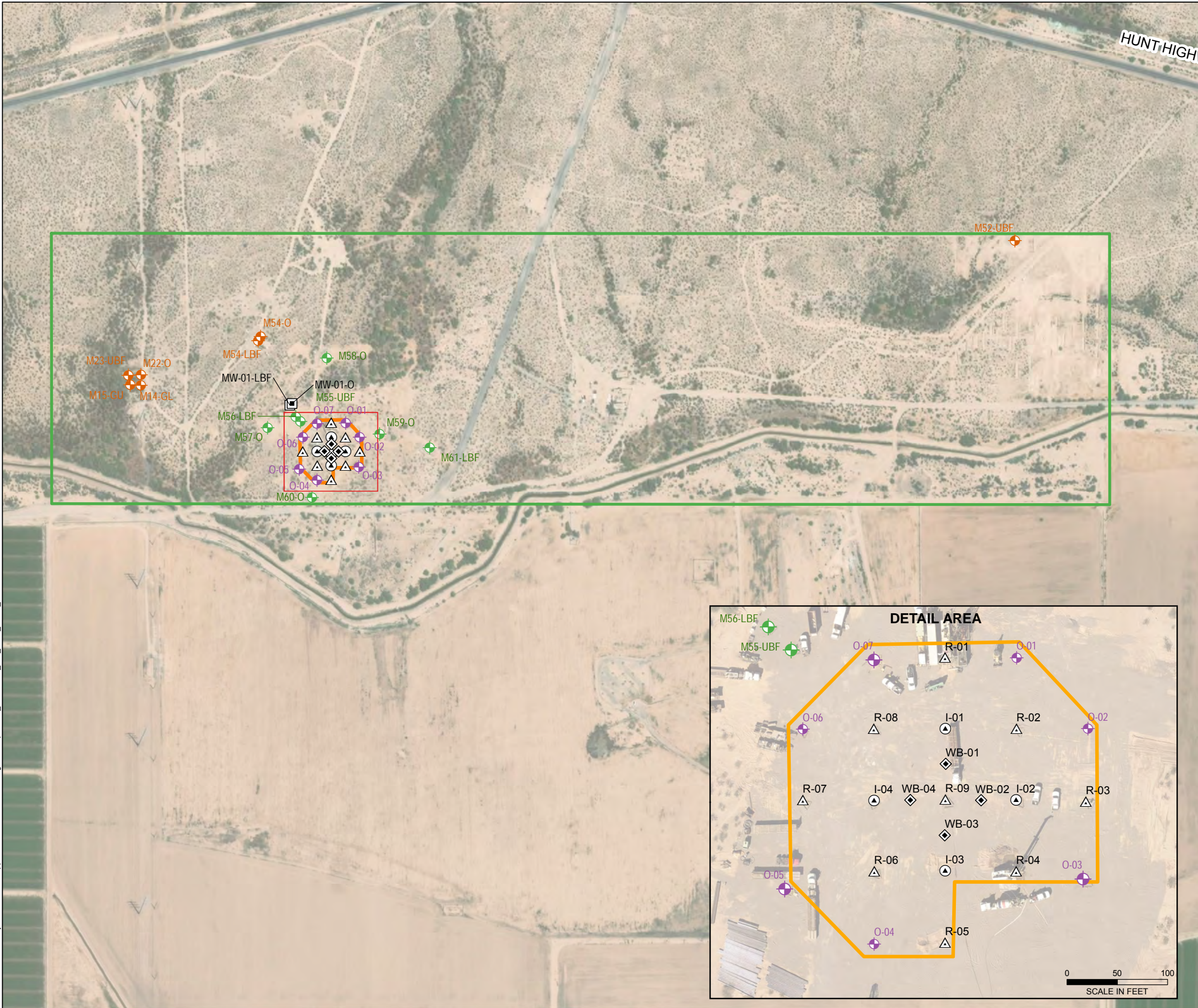
Haley & Aldrich, Inc., 2017. *Bid Specification: Drilling, Installation, and Testing of Class III Observation Wells, Production Test Facility, Florence, Arizona*. Revised September 2017.

Enclosures:

- Figure 1 – Well Locations
- Figure 2 – Well O-07 As-Built Diagram
- Figure 3 – Geophysical Data and Lithologic Log
- Appendix A – Arizona Department of Water Resources Well Registry Report
- Appendix B – Lithologic Log
- Appendix C – Chemical Characteristics of Formation Water
- Appendix D – Well Completion Documentation
- Appendix E – Geophysical Logs
- Appendix F – Cement Bond Log Summary
- Appendix G – SAPT Documentation
- Appendix H – Well Development Field Forms
- Appendix I – Well Video Log

## FIGURES

GIS FILE PATH: G:\Projects\Florence Copper\129687 PTF Well Drilling\GIS\Maps\2018\_07129687\_010\_A001\_WELL\_LOCATIONS.mxd — USER: dfm — LAST SAVED: 7/17/2018 10:24:09 AM



**LEGEND**

- OBSERVATION WELL
- SUPPLEMENTAL MONITORING WELL
- POINT-OF-COMPLIANCE WELL

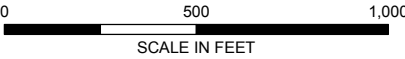
**PTF WELL**

- INJECTION
- RECOVERY
- WESTBAY WELL
- OPERATIONAL MONITORING

- PTF WELL FIELD
- STATE LAND LEASE

**NOTES**

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI



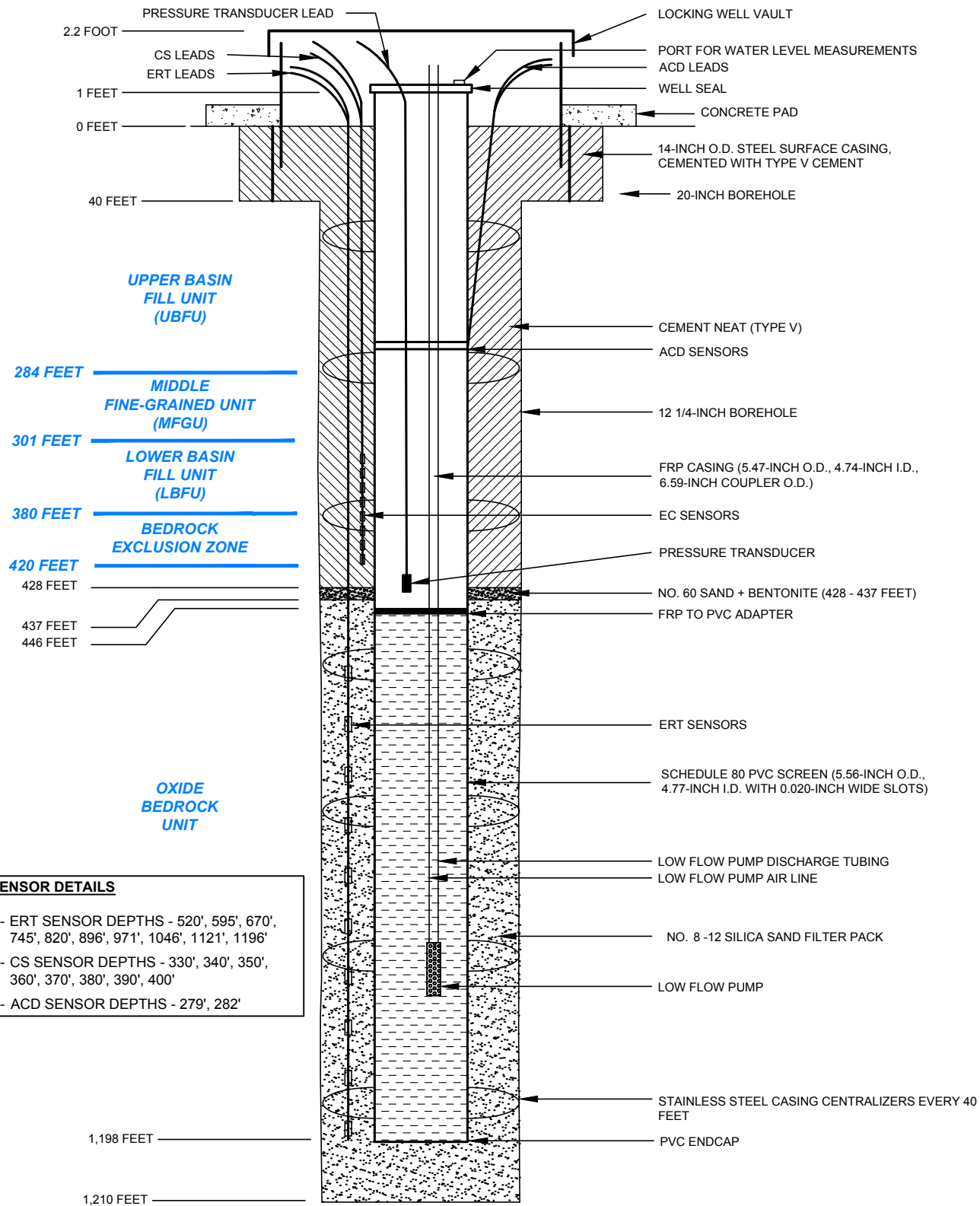
**HALEY  
ALDRICH**

FLORENCE COPPER PROJECT  
FLORENCE, ARIZONA

**WELL LOCATIONS**

**FLORENCE  
COPPER INC.** AUGUST 2018

**FIGURE 1**



**HALEY  
ALDRICH**

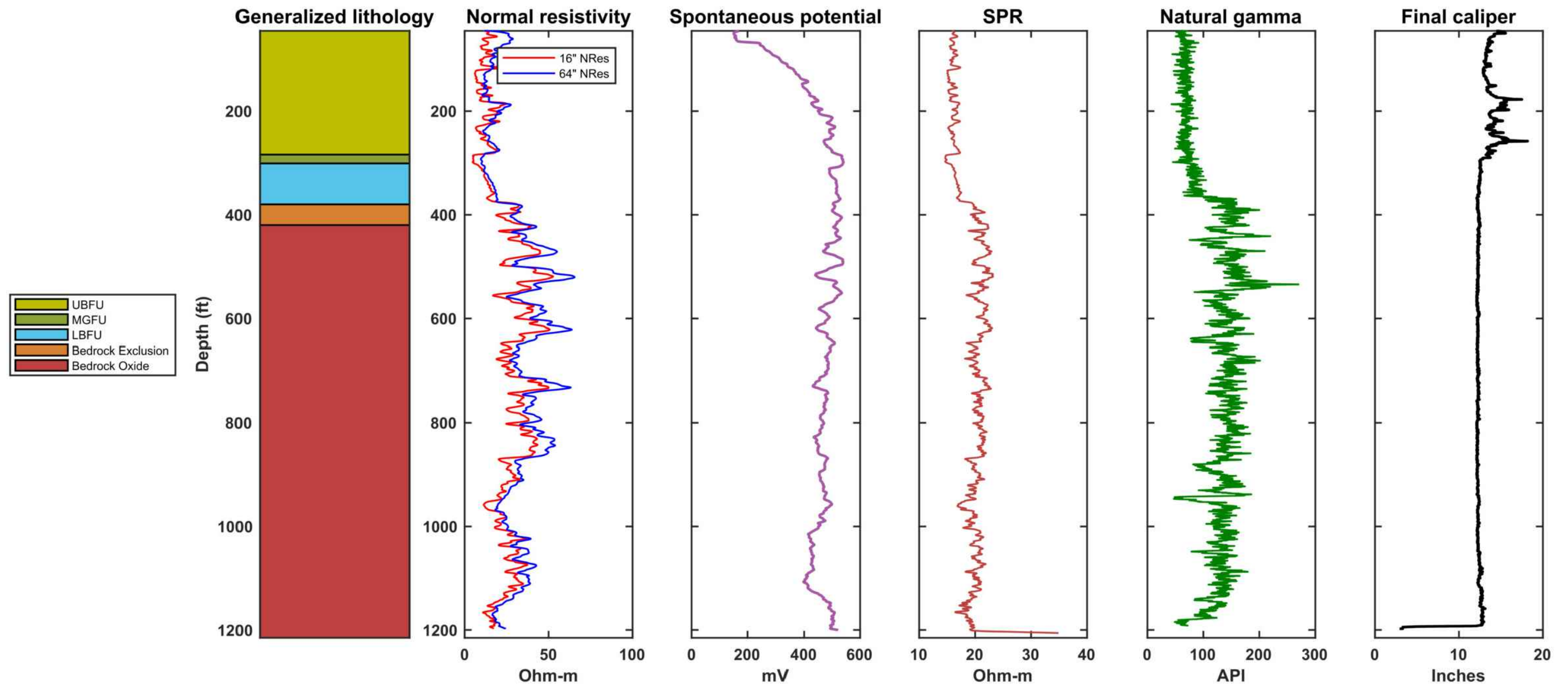
PRODUCTION TEST FACILITY  
FLORENCE COPPER, INC.  
FLORENCE, ARIZONA

## OBSERVATION WELL O-07 AS-BUILT DIAGRAM

**FLORENCE  
COPPER**

SCALE: NOT TO SCALE  
SEPTEMBER 2018

**FIGURE 2**



HALEY  
ALDRICH

PRODUCTION TEST FACILITY  
FLORENCE COPPER, INC.  
FLORENCE, ARIZONA

OBSERVATION WELL O-07  
GEOPHYSICAL DATA AND  
LITHOLOGIC LOG

FLORENCE  
COPPER

SCALE: AS SHOWN  
SEPTEMBER 2018

FIGURE 3

## **APPENDIX A**

### **Arizona Department of Water Resources Well Registry Report**

Run Date: 04/25/2017

# AZ DEPARTMENT OF WATER RESOURCES

## WELL REGISTRY REPORT - WELLS55

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Location	D	4.0	9.0	28	C	B	D	Well Reg.No	55 - 227236	AMA	PINAL	AMA
----------	---	-----	-----	----	---	---	---	-------------	-------------	-----	-------	-----

Registered Name	AZ STATE LAND DEPT. 1616 W. ADAMS ST. ATTN: LISA ATKINS PHOENIX	AZ 85007	File Type	NEW WELLS (INTENTS OR APPLICATIONS)
			Application/Issue Date	04/19/2017

Owner	OWNER	Well Type	ENV - MONITOR
Driller No.	823	SubBasin	ELOY
Driller Name	NATIONAL EWP, INC.	Watershed	UPPER GILA RIVER
Driller Phone	480-558-3500	Registered Water Uses	MONITORING
County	PINAL	Registered Well Uses	MONITOR
		Discharge Method	NO DISCHARGE METHOD LISTED
		Power	NO POWER CODE LISTED

Intended Capacity GPM	0.00
-----------------------	------

Well Depth	0.00	Case Diam	0.00	Tested Cap	0.00
Pump Cap.	0.00	Case Depth	0.00	CRT	
Draw Down	0.00	Water Level	0.00	Log	
		Acres Irrig	0.00	Finish	NO CASING CODE LISTED

Contamination Site: NO - NOT IN ANY REMEDIAL ACTION SITE

Tribe: Not in a tribal zone

Comments Well O-07  
AZ State Land Dept. Mineral Lease #11-026500

Current Action

4/25/2017	555	DRILLER & OWNER PACKETS MAILED
Action Comment: TNV		

Action History

4/25/2017	550	DRILLING AUTHORITY ISSUED
Action Comment: TNV		
4/19/2017	155	NOI RECEIVED FOR A NEW NON-PRODUCTION WELL
Action Comment: TNV		

ARIZONA DEPARTMENT OF WATER RESOURCES  
1110 W. Washington St. Suite 310  
Phoenix, Arizona 85007

THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILLING OPERATIONS

WELL REGISTRATION NO: 55-227236 WELL OWNER ID: O-07

AUTHORIZED DRILLER: NATIONAL EWP, INC.

LICENSE NO: 823

NOTICE OF INTENTION TO DRILL ENV - MONITOR WELL(S) HAS BEEN FILED WITH THE DEPARTMENT BY:

WELL OWNER: AZ STATE LAND DEPT. 1616 W. ADAMS ST. ATTN: LISA ATKINS PHOENIX, AZ, 85007

THE WELL(S) IS/ARE TO BE LOCATED IN THE:

SE 1/4 of the NW 1/4 of the SW 1/4 Section 28 Township 4.0 SOUTH Range 9.0 EAST

NO. OF WELLS IN THIS PROJECT: 1

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE DAY OF April 19, 2018

*Sella Muriello*

GROUNDWATER PERMITTING AND WELLS

THE DRILLER MUST FILE A LOG OF THE WELL WITHIN 30 DAYS OF COMPLETION OF DRILLING.



ARIZONA DEPARTMENT of WATER RESOURCES  
1110 W. Washington St. Suite 310  
Phoenix, AZ 85007  
602-771-8500  
azwater.gov



DOUGLAS A. DUCEY  
Governor

THOMAS BUSCHATZKE  
Director

April 25, 2017

AZ STATE LAND DEPT.  
1616 W. ADAMS ST.  
ATTN: LISA ATKINS  
PHOENIX, AZ 85007

Registration No. 55- 227236  
File Number: D(4-9) 28 CBD

Dear Well Applicant:

Enclosed is a copy of the Notice of Intention to Drill (NOI) a well which you or your driller recently filed with the Department of Water Resources. This letter is to inform you that the Department has approved the NOI and has mailed, or made available for download, a drilling authorization card to your designated well drilling contractor. The driller may not begin drilling until he/she has received the authorization, and must keep it in their possession at the well site during drilling. Although the issuance of this drill card authorizes you to drill the proposed well under state law, the drilling of the well may be subject to restrictions or regulations imposed by other entities.

Well drilling activities must be completed within one year after the date the NOI was filed with the Department. If drilling is not completed within one year, a new NOI must be filed and authorization from this Department received before proceeding with drilling. If the well cannot be successfully completed as initially intended (dry hole, cave in, lost tools, etc.), the well must be properly abandoned and a Well Abandonment Completion Report must be filed by your driller [as required by A.A.C. R12-15-816(F)].

If you change drillers, you must notify the Department of the new driller's identity on a Request to Change Well Information (form 55-71A). Please ensure that the new driller is licensed by the Department to drill the type of well you require. A new driller may not begin drilling until he/she receives a new drilling authorization card from the Department.

If you find it necessary to change the location of the proposed well(s), you may not proceed with drilling until you file an amended NOI with the Department. An amended drilling authorization card will then be issued to the well drilling contractor, which must be in their possession before drilling begins.

Arizona statute [A.R.S. § 45-600] requires registered well owners to file a Pump Installation Completion Report (form 55-56) with the Department within 30 days after the installation of pumping equipment, if authorized. A blank report is enclosed for your convenience. State statute also requires the driller to file a complete and accurate Well Drillers Report and Well Log (form 55-55) within 30 days after completion of drilling. A blank report form was provided to your driller with the drilling authorization card. You should insist and ensure that all of the required reports are accurately completed and timely filed with the Department.

Please be advised that Arizona statute [A.R.S. § 45-593(C)] requires a registered well owner to notify the Department of a change in ownership of the well and/or information pertaining to the physical characteristics of the well in order to keep this well registration file current and accurate. Any change in well information or a request to change well driller must be filed on a Request to Change Well Information form (form 55-71A) that may be downloaded from the ADWR Internet website at [www.azwater.gov](http://www.azwater.gov).

Sincerely,

Groundwater Permitting and Wells Section



Arizona Department of Water Resources  
Groundwater Permitting and Wells Section  
P.O. Box 36020 Phoenix, Arizona 85067-6020  
(602) 771-8500 • (602) 771-8690  
[www.azwater.gov](http://www.azwater.gov)

**Notice of Intent to  
Drill, Deepen, or Modify a  
Monitor / Piezometer / Environmental Well**

**\$150  
FEE**

- Review instructions prior to completing form in black or blue ink.
  - You must include with your Notice:
    - \$150 check or money order for the filing fee.
    - Well construction diagram, labeling all specifications listed in Section 6 and Section 7.
- Authority for fee: A.R.S. § 45-596 and A.A.C. R12-15-104.

AMA / LINA <i>Final</i>	B <i>Pin 11</i>	FILE NUMBER <i>D(4-9)28 CBD</i>
RECEIVED DATE <i>4/19/2017</i>	WS <i>08 UGR</i>	WELL REGISTRATION NUMBER <i>55 - 227236</i>
ISSUED DATE <i>4/25/2017</i>	REMEDIAL ACTION SITE <i>000</i>	

**SECTION 1. REGISTRY INFORMATION**

To determine the location of well, please refer to the Well Registry Map (<https://gisweb.azwater.gov/WellRegistry/Default.aspx>) and/or Google Earth (<http://www.earthpoint.us/Townships.aspx>)

Well Type	Proposed Action	Location of Well
CHECK ONE <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Piezometer <input type="checkbox"/> Vadose Zone <input type="checkbox"/> Air Sparging <input type="checkbox"/> Soil Vapor Extraction <input type="checkbox"/> Other (please specify):	CHECK ONE <input checked="" type="checkbox"/> Drill New Well <input type="checkbox"/> Deepen <input type="checkbox"/> Modify  WELL REGISTRATION NUMBER (if Deepening or Modifying) <i>55 -</i>	WELL LOCATION ADDRESS (IF ANY)  TOWNSHIP (N/S) RANGE (E/W) SECTION 160 ACRE 40 ACRE 10 ACRE <i>4.0 S 9.0 E 28 SW 1/4 NW 1/4 SE 1/4</i>  COUNTY ASSESSOR'S PARCEL ID NUMBER  BOOK MAP PARCEL <i>1001</i>  COUNTY WHERE WELL IS LOCATED <i>PINAL</i>

**SECTION 2. OWNER INFORMATION**

Land Owner	Well Owner (check this box if Land Owner and Well Owner are same <input type="checkbox"/> )
FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL <i>AZ State Land Dept (Mineral Lease # 11-026500)</i>	FULL NAME OF COMPANY, GOVERNMENT AGENCY, OR INDIVIDUAL <i>Florence Copper, Inc.</i>
MAILING ADDRESS <i>1616 W Adams St</i>	MAILING ADDRESS <i>1575 W Hunt Hwy</i>
CITY / STATE / ZIP CODE <i>Phoenix, AZ 85007</i>	CITY / STATE / ZIP CODE <i>Florence, AZ 85132</i>
CONTACT PERSON NAME AND TITLE <i>Lisa Atkins, State Land Commissioner</i>	CONTACT PERSON NAME AND TITLE <i>Ian Ream, Senior Hydrogeologist</i>
TELEPHONE NUMBER <i>(602) 542-4631</i>	TELEPHONE NUMBER <i>(520) 374-3984</i>
FAX	FAX <i>(520) 374-3999</i>

**SECTION 3. DRILLING AUTHORIZATION**

Drilling Firm	Consultant (if applicable)
NAME <i>National EWP</i>	CONSULTING FIRM <i>Haley &amp; Aldrich, Inc.</i>
DWR LICENSE NUMBER <i>823</i>	CONTACT PERSON NAME <i>Mark Nicholls</i>
ROC LICENSE CATEGORY <i>A-4</i>	TELEPHONE NUMBER <i>602-760-2423</i>
TELEPHONE NUMBER <i>(480) 558-3500</i>	FAX <i>602-760-2448</i>
FAX <i>480-558-3525</i>	EMAIL ADDRESS <i>mnicholls@haleyaldrich.com</i>
EMAIL ADDRESS <i>jstephens@nationalewp.com</i>	

**SECTION 4.**

Questions	Yes	No	Explanation:
1. Are all annular spaces between the casing(s) and the borehole for the placement of grout at least 2 inches?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2-inch annular spaces are special standards required for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
2. Is the screened or perforated interval of casing greater than 100 feet in length?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	100-foot maximum screen intervals are a special standard for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
3. Are you requesting a variance to use thermoplastic casing in lieu of steel casing in the surface seal?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The wells must be constructed in a vault. Pursuant to A.A.C. R12-15-801 (27) a "vault" is defined as a tamper-resistant watertight structure used to complete a well below the land surface.
4. Is there another well name or identification number associated with this well? (e.g., MW-1, PZ2, 06-04, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, please state <i>O-07</i>
5. Have construction plans been coordinated with the Arizona Department of Environmental Quality?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, please state agency contact & phone number <i>David Haaq, 602-771-4669</i>
6. For monitor wells, is dedicated pump equipment to be installed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If yes, please state design pump capacity (Gallons per Minute)
7. Is this well a new well located in an Active Management Area AND intended to pump water for the purpose of remediating groundwater?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	You must also file a supplemental form A.R.S. § 45-454(c) & (f) unless the well is a replacement well and the total number of operable wells on the site is not increasing. (See instructions)
8. Will the well registration number be stamped on the vault cover or on the upper part of the casing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If no, where will the registration number be placed?

# Notice of Intent to Drill, Deepen, or Modify a Monitor / Piezometer / Environmental Well

WELL REGISTRATION NUMBER  
55 - 227236

## SECTION 6. WELL CONSTRUCTION DETAILS

<b>Drill Method</b> CHECK ONE <input type="checkbox"/> Air Rotary <input type="checkbox"/> Bored or Augered <input type="checkbox"/> Cable Tool <input type="checkbox"/> Dual Rotary <input checked="" type="checkbox"/> Mud Rotary <input type="checkbox"/> Reverse Circulation <input type="checkbox"/> Driven <input type="checkbox"/> Jetted <input type="checkbox"/> Air Percussion / Odex Tubing <input type="checkbox"/> Other (please specify):	<b>Method of Well Development</b> CHECK ONE <input checked="" type="checkbox"/> Airlift <input type="checkbox"/> Bail <input type="checkbox"/> Surge Block <input type="checkbox"/> Surge Pump <input type="checkbox"/> Other (please specify):	<b>Grout Emplacement Method</b> CHECK ONE <input checked="" type="checkbox"/> Tremie Pumped (Recommended) <input type="checkbox"/> Gravity <input type="checkbox"/> Pressure Grout <input type="checkbox"/> Other (please specify):
<b>Method of Sealing at Reduction Points</b> CHECK ONE <input checked="" type="checkbox"/> None <input type="checkbox"/> Welded <input type="checkbox"/> Swedged <input type="checkbox"/> Packed <input type="checkbox"/> Other (please specify):	<b>Surface or Conductor Casing</b> CHECK ONE <input type="checkbox"/> Flush Mount in a vault <input checked="" type="checkbox"/> Extends at least 1' above grade	
DATE CONSTRUCTION TO BEGIN 05/01/2017		

## SECTION 7. PROPOSED WELL CONSTRUCTION PLAN (attach additional page if needed)

Attach a well construction diagram labeling all specifications below.

Borehole			Casing													
DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)	DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE ( T )				PERFORATION TYPE ( T )					SLOT SIZE IF ANY (inches)	
FROM (feet)	TO (feet)		FROM (feet)	TO (feet)		STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS KNIFE	SLOTTED		IF OTHER TYPE, DESCRIBE
0	20	18	0	20	14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
20	1210	10	0	500	5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	f. b. g. / ss reinforced	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
			500	1200	5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		0.020

Annular Material										FILTER PACK				
DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE ( T )							IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE			SAND	GRAVEL	SIZE
FROM (feet)	TO (feet)	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	BENTONITE GROUT	CHIPS	PELLETS						
0	490	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	
490	495	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input checked="" type="checkbox"/>	<input type="checkbox"/>	No. 30-70
495	1210	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input checked="" type="checkbox"/>	<input type="checkbox"/>	No. 10-20

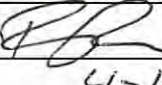
IF THIS WELL HAS NESTED CASINGS, SPECIFY NUMBER OF CASING STRINGS	EXPECTED DEPTH TO WATER (Feet Below Ground Surface) 220
-------------------------------------------------------------------	------------------------------------------------------------

## SECTION 8. PERMISSION TO ACCESS

<input type="checkbox"/> By checking this box, I hereby provide ADWR permission to enter the property for the purpose of taking water level measurements at this well. (See instructions.)
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## SECTION 9. LAND OWNER AND WELL OWNER SIGNATURE

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and

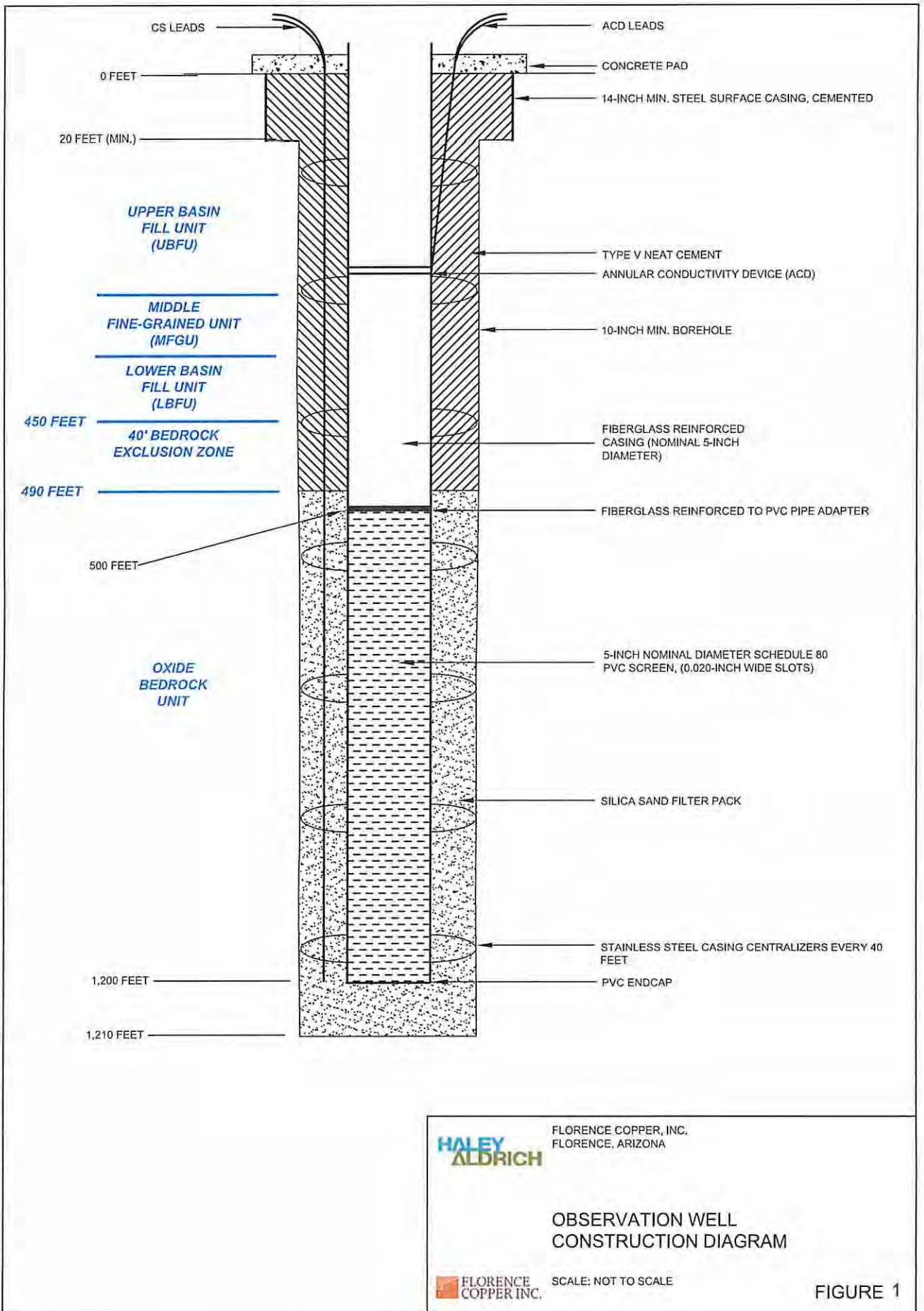
Land Owner	Well Owner (if different from Land Owner; See instructions)
PRINT NAME AND TITLE	PRINT NAME AND TITLE Ian Ream, Senior Hydrogeologist
SIGNATURE OF LAND OWNER	SIGNATURE OF WELL OWNER 
DATE	DATE 4-17-2017
<input type="checkbox"/> By checking this box, you agree to allow ADWR to contact you via electronic mail.	<input checked="" type="checkbox"/> By checking this box, you agree to allow ADWR to contact you via electronic mail.
EMAIL ADDRESS	EMAIL ADDRESS IanReam@florencecopper.com

**SECTION 5. Well Construction Diagram**

Provide a well construction diagram showing all existing well construction features listed in Section 6 and Section 7.

See attached well diagram.

G:\PROJECTS\CURIS RESOURCES\38706-CURIS FEASIBILITY\DRAWINGS\2014 UIC APP\FIGURES MM-3.DWG



20031054B

21101010A

200310450

29

20035007

20031054A

20035002B

28

PINAL AMA

20035003

ARIZONA

T 4S  
R 9E

20035006B

20035006A

200310200

200370010

32

20038001A

33

20038001B

20037013A

200380020

20031019C

20031054B

21101010A

200310450

29

20035007

20035002B

20031054A

28

**PINAL AMA**

ARIZONA

T 4S  
R 9E

20035003

20035006B

20035006A

200310200

200370010

32

20038001A

33

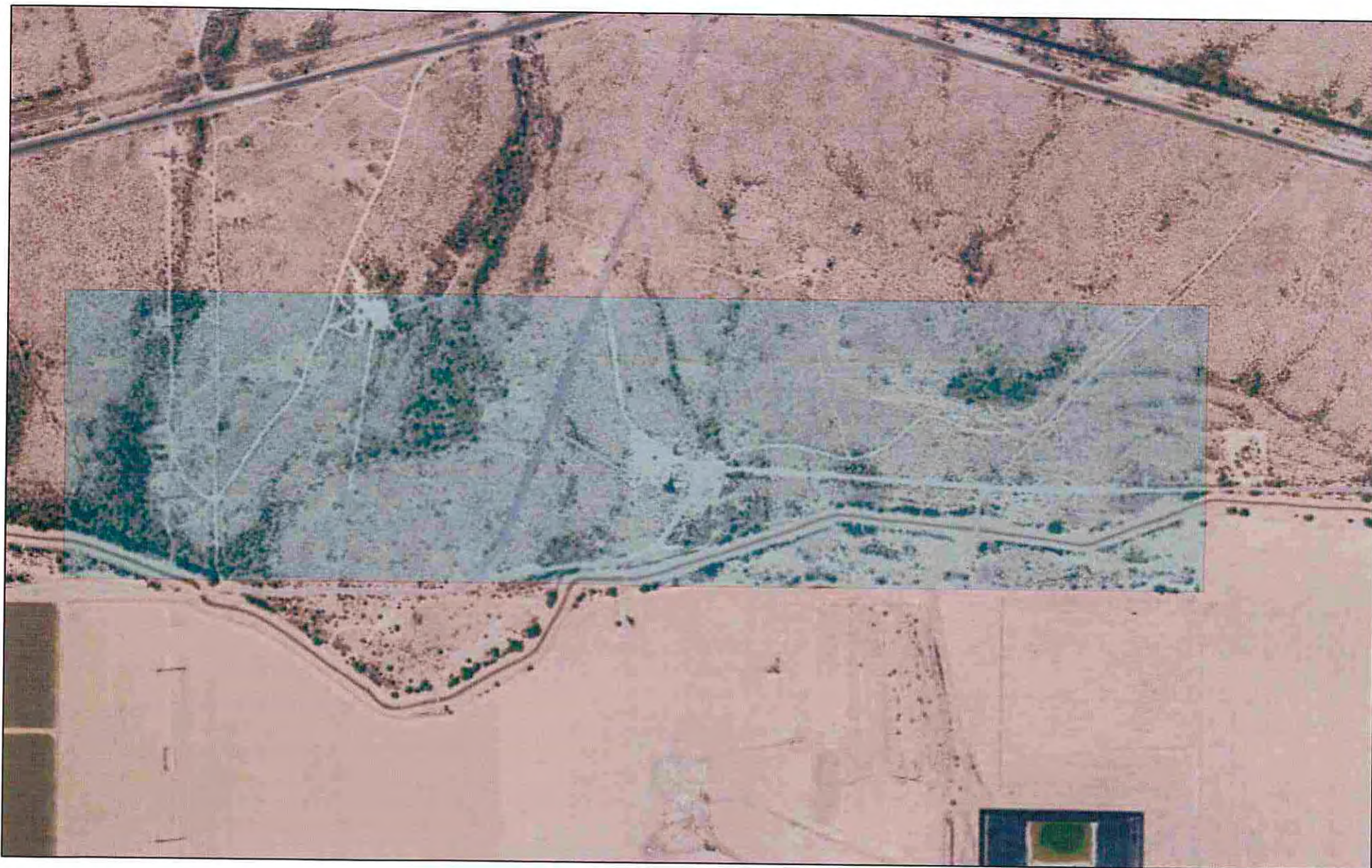
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20031019C

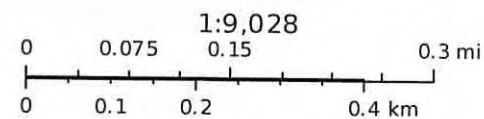
200380020

20037013A

# Arizona State Land Department



April 25, 17



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

## Torren Valdez

---

**From:** Justina Speas <[jspeas@nationalewp.com](mailto:jspeas@nationalewp.com)>  
**Sent:** Wednesday, April 26, 2017 10:10 AM  
**To:** Torren Valdez  
**Subject:** FW: ADWR Issue  
**Attachments:** Rev\_pg3\_FRP.pdf

Please see below.

Thank you,

Justina Speas  
Office Manager  
National EWP, Inc.  
1200 W. San Pedro St.  
Gilbert, AZ 85233  
480-558-3500 PH  
480-798-4722 CL  
480-558-3525 FX  
[jspeas@nationalewp.com](mailto:jspeas@nationalewp.com)

---

**From:** Candreva, Lauren [mailto:[LCandreva@halevaldrich.com](mailto:LCandreva@halevaldrich.com)]  
**Sent:** Wednesday, April 26, 2017 10:05 AM  
**To:** Justina Speas <[jspeas@nationalewp.com](mailto:jspeas@nationalewp.com)>  
**Cc:** Ian Ream <[IanReam@florencecopper.com](mailto:IanReam@florencecopper.com)>  
**Subject:** RE: ADWR Issue

Hi Justina,  
Please see the attached pg 3 of the NOI form, this form will be the same for all 7 wells since it does not contain any of the well names or locations. However, it is also the page that has the signature block, so please confirm with your ADWR contact that it will not require a signature to complete this file.  
Thanks,  
Lauren

---

**From:** Justina Speas [mailto:[jspeas@nationalewp.com](mailto:jspeas@nationalewp.com)]  
**Sent:** Tuesday, April 25, 2017 2:09 PM  
**To:** Candreva, Lauren <[LCandreva@halevaldrich.com](mailto:LCandreva@halevaldrich.com)>  
**Cc:** Ian Ream <[IanReam@florencecopper.com](mailto:IanReam@florencecopper.com)>  
**Subject:** ADWR Issue

Good Afternoon,

I just spoke with Torren Valdez with ADWR, and he informed me of an error with some of the NOI's we just turned in. On O-01 through O-07 the well construction plan shows 0 to 500' as steel, but that is not what the diagram shows.

He said we can just fix the page with the construction plan and email him a copy, and he will put it with the file.

Justina Speas  
Office Manager

National EWP, Inc.  
1200 W. San Pedro St.  
Gilbert, AZ 85233  
480-558-3500 PH  
480-798-4722 CL  
480-558-3525 FX  
[jspeas@nationalewp.com](mailto:jspeas@nationalewp.com)

**SECTION 6. WELL CONSTRUCTION DETAILS**

Drill Method	Method of Well Development	Grout Emplacement Method
CHECK ONE <input type="checkbox"/> Air Rotary <input type="checkbox"/> Bored or Augered <input type="checkbox"/> Cable Tool <input type="checkbox"/> Dual Rotary <input checked="" type="checkbox"/> Mud Rotary <input type="checkbox"/> Reverse Circulation <input type="checkbox"/> Driven <input type="checkbox"/> Jetted <input type="checkbox"/> Air Percussion / Odex Tubing <input type="checkbox"/> Other (please specify):	CHECK ONE <input checked="" type="checkbox"/> Airlift <input type="checkbox"/> Bail <input type="checkbox"/> Surge Block <input type="checkbox"/> Surge Pump <input type="checkbox"/> Other (please specify):	CHECK ONE <input checked="" type="checkbox"/> Tremie Pumped (Recommended) <input type="checkbox"/> Gravity <input type="checkbox"/> Pressure Grout <input type="checkbox"/> Other (please specify):
DATE CONSTRUCTION TO BEGIN 05/01/2017	<b>Method of Sealing at Reduction Points</b> CHECK ONE <input checked="" type="checkbox"/> None <input type="checkbox"/> Welded <input type="checkbox"/> Swedged <input type="checkbox"/> Packed <input type="checkbox"/> Other (please specify):	<b>Surface or Conductor Casing</b> CHECK ONE <input type="checkbox"/> Flush Mount in a vault <input checked="" type="checkbox"/> Extends at least 1' above grade

**SECTION 7. PROPOSED WELL CONSTRUCTION PLAN** (attach additional page if needed)

Attach a well construction diagram labeling all specifications below.

Borehole			Casing													
DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)	DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE ( T )				PERFORATION TYPE ( T )						SLOT SIZE IF ANY (inches)
FROM (feet)	TO (feet)		FROM (feet)	TO (feet)		STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS KNIFE	SLOTTED	IF OTHER TYPE, DESCRIBE	
0	20	18	0	20	14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
20	1210	10	0	500	5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FRP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
			500	1200	5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		0.020

**Annular Material**

DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE ( T )								FILTER PACK		
FROM <i>(feet)</i>	TO <i>(feet)</i>	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT- BENTONITE GROUT	BENTONITE				SAND	GRAVEL	SIZE
						GROUT	CHIPS	PELLETS				
0	490	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
490	495	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	No. 30-70
495	1210	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	No.10-20

IF THIS WELL HAS NESTED CASINGS, SPECIFY NUMBER OF CASING STRINGS

EXPECTED DEPTH TO WATER (Feet Below Ground Surface)

220

**SECTION 8. PERMISSION TO ACCESS**
☐ By checking this box, I hereby provide ADWR permission to enter the property for the purpose of taking water level measurements at this well. (See instructions.)

**SECTION 9. LAND OWNER AND WELL OWNER SIGNATURE**

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and

Land Owner	Well Owner (if different from Land Owner; See instructions)
PRINT NAME AND TITLE	PRINT NAME AND TITLE Ian Ream, Senior Hydrogeologist
SIGNATURE OF LAND OWNER	SIGNATURE OF WELL OWNER
DATE	DATE
<input type="checkbox"/> By checking this box, you agree to allow ADWR to contact you via electronic mail.	<input checked="" type="checkbox"/> By checking this box, you agree to allow ADWR to contact you via electronic mail.
EMAIL ADDRESS	EMAIL ADDRESS IanReam@florencecopper.com

## Torren Valdez

---

**From:** Robert Harding <RHarding@azland.gov>  
**Sent:** Tuesday, April 25, 2017 9:49 AM  
**To:** Torren Valdez  
**Subject:** ASLD (Landowner) Approval for NOI's - Lease #11-26500

FYI

---

**From:** Robert Harding  
**Sent:** Wednesday, March 15, 2017 2:31 PM  
**To:** samurillo@azwater.gov  
**Cc:** Fred Breedlove <FBreedlove@azland.gov>; Joe Dixon <jdixon@azland.gov>; Heide Kocsis <HKocsis@azland.gov>  
**Subject:** ASLD (Landowner) Approval for NOI's - Lease #11-26500

Stella,

As you are aware, Florence Copper is in the presence of registering a number of existing wells on State Trust Lease #11-26500 which were originally installed using single registration numbers to permit multiple monitor well installations. A number of these wells will then be permanently abandoned in accordance with Arizona Department of Water Resources (ADWR) requirements. The lessee, Florence Copper, has discussed the specifics of this registration/abandonment process with the Arizona State Land Department (ASLD), and the Department has no objection to the proposed activities.

Please accept this email as documentation of Landowner's approval for the Notice of Intent (NOI) application filings for well registration and abandonment, currently being submitted to ADWR by Florence Copper on ASLD Lease #11-26500, Section 28, T4S, R9E.

Thank you.  
Best regards,

Bob Harding  
Hydrologist  
Water Rights Section  
Arizona State Land Department  
602.542.2672  
[rharding@azland.gov](mailto:rharding@azland.gov)



## Torren Valdez

---

**From:** Ian Ream <IanReam@florencecopper.com>  
**Sent:** Friday, January 13, 2017 9:06 AM  
**To:** Torren Valdez  
**Subject:** Re: Map of monitor well locations

Hi Torren,

The pumps will be QED micro purge. They typically do a liter or two a minute. Very low flow. Looking for discreet interval samples. The flow rate is based on drawdown. The goal is not to draw down the well much more than a half a foot or 1 foot.

Thanks,

Ian Ream  
Senior Hydrogeologist  
Florence Copper

On Jan 13, 2017, at 8:56 AM, Torren Valdez <[tvaldez@azwater.gov](mailto:tvaldez@azwater.gov)> wrote:

Ian,

Would you happen to know the pump capacity (gpm) for the low-flow pumps that will be installed on those monitoring wells?

Thank you,

Torren Valdez  
Water Planning & Permitting Division  
Arizona Department of Water Resources  
602.771.8614

<image002.jpg>

---

**From:** Ian Ream [<mailto:IanReam@florencecopper.com>]  
**Sent:** Thursday, January 12, 2017 11:13 AM  
**To:** Torren Valdez <[tvaldez@azwater.gov](mailto:tvaldez@azwater.gov)>  
**Subject:** Map of monitor well locations

Hi Torren,

Here is a map with the well locations.

Please don't hesitate to contact me if you need anything else or have any questions.

Cheers,

Ian

**Ian Ream    Senior Hydrogeologist**

<image003.jpg>

Florence Copper Inc.

1575 W. Hunt Highway Florence AZ USA 85132

C 520-840-9604 T 520-374-3984 F 520-374-3999

E [ianream@florencecopper.com](mailto:ianream@florencecopper.com) Web [florencecopper.com](http://florencecopper.com)

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**\*Notice Regarding Transmission**

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## NOTICE

A.R.S. § 41-1030(B), (D), (E) and (F) provide as follows:

B. An agency shall not base a licensing decision in whole or in part on a licensing requirement or condition that is not specifically authorized by statute, rule or state tribal gaming compact. A general grant of authority in statute does not constitute a basis for imposing a licensing requirement or condition unless a rule is made pursuant to that general grant of authority that specifically authorizes the requirement or condition.

D. This section may be enforced in a private civil action and relief may be awarded against the state. The court may award reasonable attorney fees, damages and all fees associated with the license application to a party that prevails in an action against the state for a violation of this section.

E. A state employee may not intentionally or knowingly violate this section. A violation of this section is cause for disciplinary action or dismissal pursuant to the agency's adopted personnel policy.

F. This section does not abrogate the immunity provided by section 12-820.01 or 12-820.02.

ARIZONA DEPARTMENT of WATER RESOURCES  
1110 W. Washington St. Suite 310  
Engineering and Permits Division  
Phoenix, AZ 85007  
602-771-8500

### **NOTICE TO WELL DRILLERS**

This is a reminder that a valid drill card be present for the drilling of each and every well constructed on a site.\* The problem seems to occur during the construction of a well when an unexpected problem occurs. Either the hole collapses, the hole is dry, a drill bit is lost and can't be recovered, or any number of other situations where the driller feels that he needs to move over and start another well. If you encounter this type of scenario, please be aware drillers do not have the authority to start another well without first obtaining drilling authority for the new well. Please note the following statutes and regulations pertaining to well drilling and construction:

#### **ARIZONA REVISED STATUTE (A.R.S.)**

##### **A.R.S. § 45-592.A.**

A person may construct, replace or deepen a well in this state only pursuant to this article and section 45-834.01. The drilling of a well may not begin until all requirements of this article and section 45-834.01, as applicable, are met.

\*\*\*

##### **A.R.S. § 594.A.**

The director shall adopt rules establishing construction standards for new wells and replacement wells, the deepening and abandonment of existing wells and the capping of open wells.

\*\*\*

##### **A.R.S. § 600.A**

A well driller shall maintain a complete and accurate log of each well drilled.

**ARIZONA ADMINISTRATIVE CODE (A.A.C.)**

**A.A.C. R12-15-803.A.**

**A person shall not drill or abandon a well, or cause a well to be drilled or abandoned, in a manner which is not in compliance with A.R.S. Title 45, Chapter 2, Article 10, and the rules adopted thereunder.**

**\*\*\***

**A.A.C. R12-15-810.A.**

**A well drilling contractor or single well licensee may commence drilling a well only if the well drilling contractor or licensee has possession of a drilling card at the well site issued by the Director in the name of the well drilling contractor or licensee, authorizing the drilling of the specific well in the specific location.**

**\*\*\***

**A.A.C. R12-15-816.F.**

**In the course of drilling a new well, the well may be abandoned without first filing a notice of intent to abandon and without an abandonment card.**

**\* THIS REQUIREMENT DOES NOT PERTAIN TO THE DRILLING OF MINERAL EXPLORATION, GEOTECHNICAL OR HEAT PUMP BOREHOLES**

## Transaction Receipt - Success

Arizona Water Resources  
Arizona Water Resources  
MID:347501639533  
1700 W Washington St  
Phoenix , AZ 85012  
602-771-8454

---

04/19/2017 11:49AM  
Remittance ID  
Arizona041917144729704Chr  
Transaction ID:  
183294013

---

KELSEY SHERRARD  
500 Main Street  
WOODLAND, California 95695  
United States  
Visa - 3420  
Approval Code: 050257

---


Sale  
Amount: \$1,650.00

---

multiple  
N/A  
Cash receipts  
0  
dgchristiana@azwater.gov

---

Cardmember acknowledges  
receipt of goods and/or  
services in the amount of  
the total shown hereon and  
agrees to perform the  
obligations set forth by the  
cardmember's agreement with  
the issuer.

Signature   
[click here](#) to continue.

---

**Arizona Department of Water Resources**

1110 West Washington Street, Suite 310

Phoenix AZ 85007

**Customer:**

KELSEY SHERRARD  
NATIONAL EWP  
500 MAIN STREET  
WOODLAND, CA 95695

Receipt #: 17-50968  
Office: MAIN OFFICE  
Receipt Date: 04/19/2017  
Sale Type: Mail  
Cashier: WRDGC

Item No.	Function Code	AOBJ	Description	Ref ID	Qty	Unit Price	Ext Price
8505	122221	4439-6F	MONITOR, PIEZOMETER, AIR SPARGING, SOIL VAPOR EXTR	multiple wells	11	150.00	1,650.00
RECEIPT TOTAL:							1,650.00

Payment type: CREDIT CARD

Amount Paid: \$1,650.00

Payment Received Date: 04/19/2017

Authorization 183294013

Notes:

## **APPENDIX B**

### **Lithologic Log**

H&A-LITHOLOG-PHOENIX HA-LIB09-PHX.GLB LITHOLOGIC REPORT DATA TEMPLATE + GDT \\HALEYALDRICH.COM\SHAREBOS\_COMMON\129687\GINT\129687-LITH\_KF.GPJ 7 Sep 18

HALEY ALDRICH					LITHOLOGIC LOG		O-07	
Project Production Test Facility, Florence, Arizona					File No. 129687			
Client Florence Copper, Inc.					Sheet No. 1 of 15			
Contractor Cascade Drilling LLC					Cadastral Location D (4-9) 28 CBD			
Drilling Method		Reverse Rotary		Land Surface Elevation 1478.14 feet, amsl		Start 8 May 2017		
Borehole Diameter(s)		20/12.25 in.		Datum State Plane NAD 83		Finish 20 May 2017		
Rig Make & Model		Schramm T685WS		Location Section 17 E 847,624		H&A Rep. C. Price		
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION			COMMENTS	
0		SP		<b>POORLY GRADED SAND (0-30 feet)</b> Primarily coarse sand with ~5% fines and ~10% gravel to 5 mm. Sand is subangular, gravel is angular. Fines are nonplastic, have soft consistency, are brown (7.5YR 4/2), and have a weak reaction to HCL. <b>UBFU</b>			<b>Well Registry ID:</b> 55-227236 <b>Surface Completion:</b> Locking Well Vault & Concrete Pad <b>Well casing stickup:</b> 1.0 feet als <b>COLOR IDENTIFICATION</b> <i>MADE WITH WET SAMPLES</i> <i>USING MUNSELL CHART</i>	
1475								
5								
1470								
10								
1465								
15								
1460								
20								
1455								
25								
1450								
30		SW	30	<b>POORLY GRADED SAND with GRAVEL (30-45 feet)</b> Primarily fine to coarse sand with ~5% fines and ~20% gravel to 8 mm. Sand and gravel is subangular. Fines are nonplastic, have soft consistency, are brown (7.5YR 4/2), and have a strong reaction to HCL. <b>UBFU</b>				
1445								
35								
1440								
40								
1435								
45		SW	45	<b>WELL GRADED SAND (45-50 feet)</b> Primarily fine to coarse sand to 4 mm with ~5% fines. Sand is subrounded. Fines are nonplastic, have soft consistency, are brown (7.5YR 4/2), and have a weak reaction to HCL. <b>UBFU</b>				
1430								
50		SP-SC	50	<b>POORLY GRADED SAND with GRAVEL and CLAY (50-120 feet)</b> Primarily fine to medium sand with ~10% fines and ~15% gravel to 8 mm. Sand and gravel is subangular. Fines have medium plasticity, soft consistency, are reddish brown (5YR 4/4), and have a strong reaction to HCL. <b>UBFU</b>				
1425								
55								
1420								
60								
1415								
65								
1410								
70								
1405								
75								
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					O-07			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
75					
80	-1400				
85	-1395				
90	-1390				
95	-1385				
100	-1380				
105	-1375				
110	-1370				
115	-1365				
120	-1360	SP	120	<b>POORLY GRADED SAND (120-155 feet)</b> Primarily fine to medium sand with ~5% fines and ~5% gravel to 10 mm. Sand and gravel is subrounded. Fines are nonplastic, have soft consistency, are reddish brown (5YR 4/3), and have a medium reaction to HCL. <b>UBFU</b>	<b>Seal:</b> Type V neat cement 0 - 428 feet Fine sand/bentonite 428 - 437 feet
125	-1355				
130	-1350				
135	-1345				
140	-1340				
145	-1335				
150	-1330				
155	-1325				
160	-1320	SW-SC	155	<b>WELL GRADED SAND with GRAVEL (155-180 feet)</b> Primarily fine to coarse sand with ~10% fines and ~10% gravel to 10 mm. sand and gravel is subrounded. Fines have medium plasticity, soft consistency, are reddish brown (5YR 4/4), and have a medium reaction to HCL. <b>UBFU</b>	
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					O-07

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
-1315					
-165					
-1310					
-170					
-1305					
-175					
-1300					
-180		SP	180	<b>POORLY GRADED SAND (180-225 feet)</b> Primarily medium to coarse sand with ~ 5% fines and ~ 10% gravel to 12 mm. Sand and gravel is subangular. Fines are nonplastic, have soft consistency, are reddish brown (5YR 4/4), and have a medium reaction to HCL. <b>UBFU</b>	
-1295					
-185					
-1290					
-190					
-1285					
-195					
-1280					
-200					
-1275					
-205					
-1270					
-210					
-1265					
-215					
-1260					
-220					
-1255					
-225		SP	225	<b>POORLY GRADED SAND with GRAVEL (225-284 feet)</b> Primarily medium to coarse sand with ~ 5% fines and ~ 20% gravel to 8 mm. Sand and gravel is subrounded. Fines are nonplastic, have soft consistency, are reddish brown (5YR 4/4), and have a medium reaction to HCL. <b>UBFU</b>	
-1250					
-230					
-1245					
-235					
-1240					
-240					
-1235					
-245					
-1230					
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					O-07

HALEY ALDRICH				LITHOLOGIC LOG		O-07 File No. 129687 Sheet No. 4 of 15	
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION		COMMENTS	
250							
255							
260							
265							
270							
275							
280							
285							
290							
295							
300							
305							
310							
315							
320							
325							
330							
335							
284		CH	284	<p><b>SANDY FAT CLAY (284-301 feet)</b> Primarily fines with ~30% sand and ~5% gravel to 6 mm. Sand is subrounded and gravel is subangular. Fines have high plasticity, firm consistency, high toughness, high dry strength, is reddish brown (5YR 4/3), and has a strong reaction to HCL. <b>MFGU</b></p>		<p><b>ACD Sensor Depths:</b> 279, 282 feet</p>	
301		SW	301	<p><b>WELL GRADED SAND with GRAVEL (301-380 feet)</b> Primarily fine to coarse sand with ~5% fines and ~15% gravel to 8 mm. Sand is subangular, gravel is angular. Fines are nonplastic, have soft consistency, are reddish brown (5YR 5/4), and have a medium reaction to HCL. <b>LBFU</b></p>		<p><b>CS Sensor Depths:</b> 330, 340, 350, 360, 370, 380, 390, 400 feet</p>	

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

O-07

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
1140	-340				
1135	-345				
1130	-350				
1125	-355				
1120	-360				
1115	-365				
1110	-370				
1105	-375				
1100	-380		380	<b>QUARTZ MONZONITE (380-390 feet)</b> Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.	
1095	-385				
1090	-390		390	<b>DIABASE (390-400 feet)</b> Dark gray to black igneous rock.	
1085	-395				
1080	-400		400	<b>QUARTZ MONZONITE (400-650 feet)</b> Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%. Cu minerals 405-455, 495-570.	
1075	-405				
1070	-410				
1065	-415				
1060	-420				
422					
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					O-07

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
1055				<u>QUARTZ MONZONITE (400-650 feet)</u> Continued.	
1050					
1045					
1040					<b>Filter Pack:</b> 8 - 12 CO Silica Sand; 437 - 1210 feet <b>Thread Adapter:</b> Stainless Steel, SCH 80 F480 PVC to API; 446 feet
1035					
1030					<b>Well Screen:</b> Nominal 5-inch diameter, SCH 80 PVC Screen (0.020-inch slots); 446 - 1198 feet <b>ERT Sensor Depths:</b> 520, 595, 670, 745, 820, 896, 971, 1046, 1121, 1196 feet
1025					
1020					
1015					
1010					
1005					
1000					
995					
990					
985					
980					
975					
970					

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
510			509	<u>QUARTZ MONZONITE (400-650 feet)</u> Continued.	
965					
515					
960					
520					
955					
525					
950					
530					
945					
535					
940					
540					
935					
545					
930					
550					
925					
555					
920					
560					
915					
565					
910					
570					
905					
575					
900					
580					
895					
585					
890					
590					
885					
595					
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					O-07

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
			596	<u>QUARTZ MONZONITE (400-650 feet)</u> Continued.	
880					
600					
875					
605					
870					
610					
865					
615					
860					
620					
855					
625					
850					
630					
845					
635					
840					
640					
835					
645					
830					
650			650	<u>DIABASE (650-670 feet)</u> Dark gray to black igneous rock.	
825					
655					
820					
660					
815					
665					
810					
670			670	<u>QUARTZ MONZONITE (670-890 feet)</u> Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%. Cu minerals throughout.	
805					
675					
800					
680					
			682		
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					O-07

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
795				<u>QUARTZ MONZONITE (670-890 feet)</u> Continued.	
685					
790					
690					
785					
695					
780					
700					
775					
705					
770					
710					
765					
715					
760					
720					
755					
725					
750					
730					
745					
735					
740					
740					
735					
745					
730					
750					
725					
755					
720					
760					
715					
765					
710			769		
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					O-07

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
770				<u>QUARTZ MONZONITE (670-890 feet)</u> Continued.	
705					
775					
700					
780					
695					
785					
690					
790					
685					
795					
680					
800					
675					
805					
670					
810					
665					
815					
660					
820					
655					
825					
650					
830					
645					
835					
640					
840					
635					
845					
630					
850					
625					
855					
		856			
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					O-07

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
620				<b>QUARTZ MONZONITE (670-890 feet)</b> Continued.	
860					
615					
865					
610					
870					
605					
875					
600					
880					
595					
885					
590					
890			890	<b>DIABASE (890-910 feet)</b> Dark gray to black igneous rock.	
585					
895					
580					
900					
575					
905					
570					
910			910	<b>QUARTZ MONZONITE (910-1202 feet)</b> Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.	
565					
915					
560					
920					
555					
925					
550					
930					
545					
935					
540					
940					
535			943		
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					<b>O-07</b>

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
				<u>QUARTZ MONZONITE (910-1202 feet)</u> Continued.	
945					
	530				
950					
	525				
955					
	520				
960					
	515				
965					
	510				
970					
	505				
975					
	500				
980					
	495				
985					
	490				
990					
	485				
995					
	480				
1000					
	475				
1005					
	470				
1010					
	465				
1015					
	460				
1020					
	455				
1025					
	450				
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					O-07

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
1030			1030	<u>QUARTZ MONZONITE (910-1202 feet)</u> Continued.	
445					
1035					
440					
1040					
435					
1045					
430					
1050					
425					
1055					
420					
1060					
415					
1065					
410					
1070					
405					
1075					
400					
1080					
395					
1085					
390					
1090					
385					
1095					
380					
1100					
375					
1105					
370					
1110					
365					
1115					
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					O-07

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
360			1117	<u>QUARTZ MONZONITE (910-1202 feet)</u> Continued.	
1120					
355					
1125					
350					
1130					
345					
1135					
340					
1140					
335					
1145					
330					
1150					
325					
1155					
320					
1160					
315					
1165					
310					
1170					
305					
1175					
300					
1180					
295					
1185					
290					
1190					
285					
1195					
280					
1200					
275			1202		

NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
1205					
270					
1210					<b>Total Borehole Depth:</b> Driller = 1210 feet; Geophysical Logging = 1204 feet
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					O-07

## **APPENDIX C**

### **Chemical Characteristics of Formation Water**



May 23, 2018

Barbara Sylvester  
Brown & Caldwell  
201 E. Washington Suite 500  
Phoenix, AZ 85004

TEL (602) 567-3894  
FAX -

Work Order No.: 18D0619  
Order Name: Florence Copper

RE: PTF

Dear Barbara Sylvester,

Turner Laboratories, Inc. received 2 sample(s) on 04/25/2018 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.  
ADHS License AZ0066

Kevin Brim  
Project Manager

Client: Brown & Caldwell  
Project: PTF  
Work Order: 18D0619  
Date Received: 04/25/2018

Order: Florence Copper

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
18D0619-01	R-09	Ground Water	04/23/2018 1555
18D0619-02	TB	Ground Water	04/25/2018 0000

**Client:** Brown & Caldwell  
**Project:** PTF  
**Work Order:** 18D0619  
**Date Received:** 04/25/2018

**Case Narrative**

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The 8015D analysis was performed by TestAmerica Laboratories, Inc. in Phoenix, AZ.

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

D5 Minimum Reporting Limit (MRL) is adjusted due to sample dilution; analyte was non-detect in the sample.

H5 This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

M3 The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated LCS/LCSD recovery was acceptable.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND Not Detected at or above the PQL

PQL Practical Quantitation Limit

DF Dilution Factor

PRL Project Reporting Limit

Client:

Project:

Work Order:

Lab Sample ID:

Brown & Caldwell  
PTF  
18D0619  
18D0619-01

Client Sample ID: R-09

Collection Date/Time: 04/23/2018 1555

Matrix: Ground Water

Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
ICP Dissolved Metals-E 200.7 (4.4)									
Calcium	140		4.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Iron	ND		0.30		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Magnesium	27		3.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Potassium	6.8		5.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Sodium	170		5.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
ICP/MS Dissolved Metals-E 200.8 (5.4)									
Aluminum	ND		0.0800	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Antimony	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Arsenic	0.0016		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Barium	0.071		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Beryllium	ND		0.00050	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Cadmium	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Chromium	0.0051		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Cobalt	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Copper	0.011		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Lead	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Manganese	0.0020		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Nickel	0.0033		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Selenium	ND		0.0025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Thallium	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Zinc	ND		0.040		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
CVAA Dissolved Mercury-E 245.1									
Mercury	ND		0.0010		mg/L	1	04/26/2018 0955	04/26/2018 1639	MH
pH-E150.1									
pH (pH Units)	7.8			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
Temperature (°C)	22			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
ICP/MS Total Metals-E200.8 (5.4)									
Uranium	0.016		0.00050		mg/L	1	04/27/2018 1230	04/30/2018 1348	MH

Client: Brown & Caldwell

Project: PTF

Work Order: 18D0619

Lab Sample ID: 18D0619-01

Client Sample ID: R-09

Collection Date/Time: 04/23/2018 1555

Matrix: Ground Water

Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Anions by Ion Chromatography-E300.0 (2.1)									
Chloride	310		25		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Fluoride	ND		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrate (As N)	8.8		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrite (As N)	ND		0.10		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Sulfate	190		130		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Cyanide-E335.4									
Cyanide	ND		0.10		mg/L	1	04/26/2018 0845	04/30/2018 1545	AP
Alkalinity-SM2320B									
Alkalinity, Bicarbonate (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Carbonate (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Hydroxide (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Phenolphthalein (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Total (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Specific Conductance-SM2510 B									
Conductivity	1700		0.20		µmhos/cm	2	05/09/2018 1315	05/09/2018 1330	AP
Total Dissolved Solids (Residue, Filterable)-SM2540 C									
Total Dissolved Solids (Residue, Filterable)	1000		20		mg/L	1	04/26/2018 0826	05/01/2018 1600	EJ
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: 4-Bromofluorobenzene	95	70-130			%REC	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: Dibromofluoromethane	101	70-130			%REC	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: Toluene-d8	77	70-130			%REC	1	05/07/2018 1824	05/07/2018 1943	KP

Client:

Project:

Work Order:

Lab Sample ID:

Brown & Caldwell

PTF

18D0619

18D0619-02

Client Sample ID: TB

Collection Date/Time: 04/25/2018 0000

Matrix: Ground Water

Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: 4-Bromofluorobenzene	101	70-130			%REC	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: Dibromofluoromethane	110	70-130			%REC	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: Toluene-d8	103	70-130			%REC	1	05/07/2018 1824	05/07/2018 2344	KP

Client: Brown & Caldwell  
Project: PTF  
Work Order: 18D0619  
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804269 - E 245.1										
Blank (1804269-BLK1)				Prepared & Analyzed: 04/26/2018						
Mercury	ND	0.0010	mg/L							
LCS (1804269-BS1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0049	0.0010	mg/L	0.005000		98	85-115			
LCS Dup (1804269-BSD1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0048	0.0010	mg/L	0.005000		95	85-115	2	20	
Matrix Spike (1804269-MS1)				Source: 18D0394-01			Prepared & Analyzed: 04/26/2018			
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	97	85-115			
Matrix Spike Dup (1804269-MSD1)				Source: 18D0394-01			Prepared & Analyzed: 04/26/2018			
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	96	85-115	1	20	
Batch 1804292 - E200.8 (5.4)										
Blank (1804292-BLK1)				Prepared & Analyzed: 04/30/2018						
Uranium	ND	0.00050	mg/L							
LCS (1804292-BS1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115			
LCS Dup (1804292-BSD1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115	0.2	20	
Matrix Spike (1804292-MS1)				Source: 18D0614-01			Prepared & Analyzed: 04/30/2018			
Uranium	0.051	0.00050	mg/L	0.05000	0.0015	99	70-130			
Batch 1805051 - E 200.7 (4.4)										
Blank (1805051-BLK1)				Prepared & Analyzed: 05/04/2018						
Calcium	ND	4.0	mg/L							
Iron	ND	0.30	mg/L							
Magnesium	ND	3.0	mg/L							
Potassium	ND	5.0	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1805051-BS1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		109	85-115			
Iron	1.0	0.30	mg/L	1.000		104	85-115			
Magnesium	10	3.0	mg/L	10.00		105	85-115			
Potassium	10	5.0	mg/L	10.00		105	85-115			
Sodium	10	5.0	mg/L	10.00		105	85-115			
LCS Dup (1805051-BSD1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		110	85-115	1	20	
Iron	1.0	0.30	mg/L	1.000		105	85-115	0.5	20	
Magnesium	10	3.0	mg/L	10.00		105	85-115	0.06	20	
Potassium	10	5.0	mg/L	10.00		105	85-115	0.05	20	
Sodium	11	5.0	mg/L	10.00		109	85-115	4	20	

Client: Brown & Caldwell  
Project: PTF  
Work Order: 18D0619  
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805051 - E 200.7 (4.4)										
Matrix Spike (1805051-MS1)		Source: 18D0619-01		Prepared & Analyzed: 05/04/2018						
Calcium	150	4.0	mg/L	10.00	140	59	70-130			M3
Iron	1.1	0.30	mg/L	1.000	0.028	105	70-130			
Magnesium	38	3.0	mg/L	10.00	27	108	70-130			
Potassium	17	5.0	mg/L	10.00	6.8	105	70-130			
Sodium	170	5.0	mg/L	10.00	170	30	70-130			M3
Matrix Spike (1805051-MS2)		Source: 18E0021-01		Prepared & Analyzed: 05/04/2018						
Calcium	64	4.0	mg/L	10.00	54	103	70-130			
Iron	1.0	0.30	mg/L	1.000	0.0060	101	70-130			
Magnesium	21	3.0	mg/L	10.00	11	99	70-130			
Potassium	15	5.0	mg/L	10.00	4.7	104	70-130			
Sodium	99	5.0	mg/L	10.00	90	87	70-130			
Batch 1805069 - E 200.8 (5.4)										
Blank (1805069-BLK1)		Prepared & Analyzed: 05/07/2018								
Aluminum	ND	0.0400	mg/L							
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Barium	ND	0.00050	mg/L							
Beryllium	ND	0.00025	mg/L							
Cadmium	ND	0.00025	mg/L							
Chromium	ND	0.00050	mg/L							
Cobalt	ND	0.00025	mg/L							
Copper	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Manganese	ND	0.00025	mg/L							
Nickel	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Zinc	ND	0.040	mg/L							
LCS (1805069-BS1)		Prepared & Analyzed: 05/07/2018								
Aluminum	0.104	0.0400	mg/L	0.1000		104	85-115			
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115			
Arsenic	0.050	0.00050	mg/L	0.05000		100	85-115			
Barium	0.050	0.00050	mg/L	0.05000		100	85-115			
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115			
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115			
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115			
Cobalt	0.051	0.00025	mg/L	0.05000		101	85-115			
Copper	0.051	0.00050	mg/L	0.05000		103	85-115			
Lead	0.049	0.00050	mg/L	0.05000		98	85-115			
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115			
Nickel	0.051	0.00050	mg/L	0.05000		102	85-115			
Selenium	0.051	0.0025	mg/L	0.05000		103	85-115			
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115			
Zinc	0.10	0.040	mg/L	0.1000		101	85-115			

Client: Brown & Caldwell  
Project: PTF  
Work Order: 18D0619  
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805069 - E 200.8 (5.4)										
LCS Dup (1805069-BSD1)				Prepared & Analyzed: 05/07/2018						
Aluminum	0.115	0.0400	mg/L	0.1000		115	85-115	10	20	
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115	0.7	20	
Arsenic	0.050	0.00050	mg/L	0.05000		101	85-115	0.8	20	
Barium	0.051	0.00050	mg/L	0.05000		102	85-115	1	20	
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115	0.2	20	
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115	0.2	20	
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115	0.4	20	
Cobalt	0.050	0.00025	mg/L	0.05000		101	85-115	0.5	20	
Copper	0.052	0.00050	mg/L	0.05000		105	85-115	2	20	
Lead	0.049	0.00050	mg/L	0.05000		98	85-115	0.1	20	
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115	0.09	20	
Nickel	0.051	0.00050	mg/L	0.05000		103	85-115	0.8	20	
Selenium	0.052	0.0025	mg/L	0.05000		104	85-115	2	20	
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115	0.06	20	
Zinc	0.10	0.040	mg/L	0.1000		104	85-115	3	20	
Matrix Spike (1805069-MS1)				Source: 18D0693-01	Prepared & Analyzed: 05/07/2018					
Aluminum	0.239	0.0400	mg/L	0.1000	0.166	74	70-130			
Antimony	0.045	0.00050	mg/L	0.05000	0.00024	90	70-130			
Arsenic	0.056	0.00050	mg/L	0.05000	0.0035	104	70-130			
Barium	0.16	0.00050	mg/L	0.05000	0.12	94	70-130			
Beryllium	0.045	0.00025	mg/L	0.05000	0.000029	90	70-130			
Cadmium	0.047	0.00025	mg/L	0.05000	ND	94	70-130			
Chromium	0.049	0.00050	mg/L	0.05000	0.00052	98	70-130			
Cobalt	0.048	0.00025	mg/L	0.05000	0.00097	95	70-130			
Copper	0.051	0.00050	mg/L	0.05000	0.0020	98	70-130			
Lead	0.047	0.00050	mg/L	0.05000	0.00016	94	70-130			
Manganese	0.054	0.00025	mg/L	0.05000	0.0075	94	70-130			
Nickel	0.049	0.00050	mg/L	0.05000	0.0018	94	70-130			
Selenium	0.057	0.0025	mg/L	0.05000	ND	114	70-130			
Thallium	0.048	0.00050	mg/L	0.05000	0.000038	96	70-130			
Zinc	0.11	0.040	mg/L	0.1000	ND	109	70-130			

Client: Brown & Caldwell  
Project: PTF  
Work Order: 18D0619  
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804261 - SM2540 C										
Duplicate (1804261-DUP1)		Source: 18D0606-01		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	630	20	mg/L		630			0.3	5	
Duplicate (1804261-DUP2)		Source: 18D0606-02		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	610	20	mg/L		620			0.8	5	
Batch 1804268 - E335.4										
Blank (1804268-BLK1)		Prepared: 04/26/2018 Analyzed: 04/30/2018								
Cyanide	ND	0.10	mg/L							
LCS (1804268-BS1)		Prepared: 04/26/2018 Analyzed: 04/30/2018								
Cyanide	2.0	0.10	mg/L	2.000		101	90-110			
LCS Dup (1804268-BSD1)		Prepared: 04/26/2018 Analyzed: 04/30/2018								
Cyanide	2.0	0.10	mg/L	2.000		101	90-110	0.1	20	
Matrix Spike (1804268-MS1)		Source: 18D0602-03		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.1	0.10	mg/L	2.000	ND	103	90-110			
Matrix Spike Dup (1804268-MSD1)		Source: 18D0602-03		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000	ND	98	90-110	5	20	
Batch 1804272 - E150.1										
Duplicate (1804272-DUP1)		Source: 18D0662-02		Prepared & Analyzed: 04/26/2018						
pH (pH Units)	7.8		-		7.8			0.1	200	H5
Temperature (°C)	21		-		21			2	200	H5
Batch 1805027 - SM2320B										
LCS (1805027-BS1)		Prepared & Analyzed: 05/03/2018								
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110			
LCS Dup (1805027-BSD1)		Prepared & Analyzed: 05/03/2018								
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110	0	10	
Matrix Spike (1805027-MS1)		Source: 18D0606-02		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	96	85-115			
Matrix Spike Dup (1805027-MSD1)		Source: 18D0606-02		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	95	85-115	0.5	10	
Batch 1805103 - SM2510 B										
LCS (1805103-BS1)		Prepared & Analyzed: 05/09/2018								
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200			
LCS Dup (1805103-BSD1)		Prepared & Analyzed: 05/09/2018								
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200	0.7	200	
Duplicate (1805103-DUP1)		Source: 18E0192-01		Prepared & Analyzed: 05/09/2018						
Conductivity	4.0	0.10	µmhos/cm		4.0			0	10	

Client: Brown & Caldwell  
Project: PTF  
Work Order: 18D0619  
Date Received: 04/25/2018

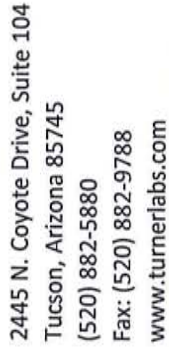
QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805074 - SW8260B										
Blank (1805074-BLK1)				Prepared & Analyzed: 05/07/2018						
Benzene	ND	0.50	ug/L							
Carbon disulfide	ND	2.0	ug/L							
Ethylbenzene	ND	0.50	ug/L							
Toluene	ND	0.50	ug/L							
Xylenes, Total	ND	1.5	ug/L							
Surrogate: 4-Bromofluorobenzene	25.0		ug/L	25.00		100	70-130			
Surrogate: Dibromofluoromethane	26.9		ug/L	25.00		107	70-130			
Surrogate: Toluene-d8	25.1		ug/L	25.00		100	70-130			
LCS (1805074-BS1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	29		ug/L	25.00		114	70-130			
Benzene	27		ug/L	25.00		109	70-130			
Chlorobenzene	29		ug/L	25.00		115	70-130			
Toluene	25		ug/L	25.00		101	70-130			
Trichloroethene	26		ug/L	25.00		103	70-130			
Surrogate: 4-Bromofluorobenzene	24.6		ug/L	25.00		98	70-130			
Surrogate: Dibromofluoromethane	25.6		ug/L	25.00		102	70-130			
Surrogate: Toluene-d8	24.8		ug/L	25.00		99	70-130			
LCS Dup (1805074-BSD1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00		110	70-130	4	30	
Benzene	26		ug/L	25.00		104	70-130	5	30	
Chlorobenzene	26		ug/L	25.00		105	70-130	9	30	
Toluene	24		ug/L	25.00		96	70-130	5	30	
Trichloroethene	25		ug/L	25.00		98	70-130	4	30	
Surrogate: 4-Bromofluorobenzene	24.4		ug/L	25.00		98	70-130			
Surrogate: Dibromofluoromethane	26.1		ug/L	25.00		104	70-130			
Surrogate: Toluene-d8	25.1		ug/L	25.00		100	70-130			
Matrix Spike (1805074-MS1)				Source: 18D0582-02	Prepared & Analyzed: 05/07/2018					
1,1-Dichloroethene	27		ug/L	25.00	0.070	109	70-130			
Benzene	26		ug/L	25.00	0.020	104	70-130			
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130			
Toluene	27		ug/L	25.00	3.5	95	70-130			
Trichloroethene	24		ug/L	25.00	0.040	97	70-130			
Surrogate: 4-Bromofluorobenzene	24.4		ug/L	25.00		98	70-130			
Surrogate: Dibromofluoromethane	26.4		ug/L	25.00		106	70-130			
Surrogate: Toluene-d8	24.9		ug/L	25.00		100	70-130			
Matrix Spike Dup (1805074-MSD1)				Source: 18D0582-02	Prepared & Analyzed: 05/07/2018					
1,1-Dichloroethene	27		ug/L	25.00	0.070	108	70-130	0.8	30	
Benzene	25		ug/L	25.00	0.020	101	70-130	2	30	
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130	0.3	30	
Toluene	27		ug/L	25.00	3.5	95	70-130	0.1	30	
Trichloroethene	24		ug/L	25.00	0.040	95	70-130	2	30	
Surrogate: 4-Bromofluorobenzene	24.7		ug/L	25.00		99	70-130			
Surrogate: Dibromofluoromethane	26.4		ug/L	25.00		106	70-130			
Surrogate: Toluene-d8	25.3		ug/L	25.00		101	70-130			

Client: Brown & Caldwell  
Project: PTF  
Work Order: 18D0619  
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804245 - E300.0 (2.1)										
Blank (1804245-BLK1)				Prepared & Analyzed: 04/25/2018						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1804245-BS1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		92	90-110			
Fluoride	2.0	0.50	mg/L	2.000		101	90-110			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000		95	90-110			
Nitrogen, Nitrite (As N)	2.3	0.10	mg/L	2.500		92	90-110			
Sulfate	12	5.0	mg/L	12.50		96	90-110			
LCS Dup (1804245-BSD1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		94	90-110	2	10	
Fluoride	2.0	0.50	mg/L	2.000		101	90-110	0.4	10	
Nitrogen, Nitrate (As N)	4.9	0.50	mg/L	5.000		98	90-110	3	10	
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500		95	90-110	3	10	
Sulfate	12	5.0	mg/L	12.50		98	90-110	3	10	
Matrix Spike (1804245-MS1)		Source: 18D0613-08		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	89	80-120			
Matrix Spike (1804245-MS2)		Source: 18D0625-01		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000	0.46	92	80-120			
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120			
Matrix Spike (1804245-MS3)		Source: 18D0614-01RE1		Prepared & Analyzed: 04/26/2018						
Chloride	17		mg/L	12.50	6.4	88	80-120			
Sulfate	28		mg/L	12.50	18	85	80-120			
Matrix Spike Dup (1804245-MSD1)		Source: 18D0613-08		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120	0.4	10	
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	90	80-120	0.6	10	
Matrix Spike Dup (1804245-MSD2)		Source: 18D0625-01		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.1	0.50	mg/L	5.000	0.46	92	80-120	0.2	10	
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120	0.4	10	
Matrix Spike Dup (1804245-MSD3)		Source: 18D0614-01RE1		Prepared & Analyzed: 04/26/2018						
Chloride	18		mg/L	12.50	6.4	89	80-120	0.6	10	
Sulfate	29		mg/L	12.50	18	86	80-120	0.6	10	



TURNER WORK ORDER # 18D0619 DATE 4/23/18 PAGE 1 OF 1

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## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Phoenix

4625 East Cotton Ctr Blvd

Suite 189

Phoenix, AZ 85040

Tel: (602)437-3340

TestAmerica Job ID: 550-101943-1

Client Project/Site: 18D0619

For:

Turner Laboratories, Inc.

2445 North Coyote Drive

Suite 104

Tucson, Arizona 85745

Attn: Kevin Brim



Authorized for release by:

5/16/2018 12:23:25 PM

Ken Baker, Project Manager II

(602)659-7624

[ken.baker@testamericainc.com](mailto:ken.baker@testamericainc.com)

### LINKS

Review your project  
results through

TotalAccess

Have a Question?



Visit us at:

[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Definitions/Glossary

Client: Turner Laboratories, Inc.  
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

### Qualifiers

#### GC Semi VOA

Qualifier	Qualifier Description
Q9	Insufficient sample received to meet method QC requirements.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Turner Laboratories, Inc.  
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

**Job ID: 550-101943-1**

**Laboratory: TestAmerica Phoenix**

## Narrative

**Job Narrative**  
**550-101943-1**

### Comments

No additional comments.

### Receipt

The sample was received on 4/27/2018 10:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8° C.

### GC Semi VOA

Method(s) 8015D: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD) associated with preparation batch 550-145985 and analytical batch 550-146884. Affected samples have been added a Q9 qualifier. 18D0619-01 (550-101943-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### Organic Prep

Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3510C.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: Turner Laboratories, Inc.  
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-101943-1	18D0619-01	Water	04/23/18 15:55	04/27/18 10:50

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Detection Summary

Client: Turner Laboratories, Inc.  
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01      Lab Sample ID: 550-101943-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
ORO (C22-C32)	0.21	Q9	0.20	mg/L	1		8015D	Total/NA

- 1
- 2
- 3
- 4
- 5
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- 8
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- 10
- 11
- 12
- 13
- 14
- 15

This Detection Summary does not include radiochemical test results.

# Client Sample Results

Client: Turner Laboratories, Inc.  
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

**Client Sample ID: 18D0619-01**

**Date Collected: 04/23/18 15:55**

**Date Received: 04/27/18 10:50**

**Lab Sample ID: 550-101943-1**

**Matrix: Water**

## Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
<b>ORO (C22-C32)</b>	<b>0.21</b>	<b>Q9</b>	0.20	mg/L		04/30/18 14:16	05/10/18 23:29	1
DRO (C10-C22)	ND	Q9	0.10	mg/L		04/30/18 14:16	05/10/18 23:29	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl (Surr)	79		10 - 150			04/30/18 14:16	05/10/18 23:29	1

# Surrogate Summary

Client: Turner Laboratories, Inc.  
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)		
Lab Sample ID	Client Sample ID	OTPH (10-150)
550-101943-1	18D0619-01	79
LCS 550-145985/2-A	Lab Control Sample	79
LCSD 550-145985/3-A	Lab Control Sample Dup	79
MB 550-145985/1-A	Method Blank	65

Surrogate Legend

OTPH = o-Terphenyl (Surr)

- 1
- 2
- 3
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- 14
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# QC Sample Results

Client: Turner Laboratories, Inc.  
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

## Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 550-145985/1-A  
Matrix: Water  
Analysis Batch: 146884

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 145985

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	ND		0.20	mg/L		04/30/18 14:15	05/11/18 11:16	1
DRO (C10-C22)	ND		0.10	mg/L		04/30/18 14:15	05/11/18 11:16	1
Surrogate	MB %Recovery	MB Qualifier	Limits			Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	65		10 - 150			04/30/18 14:15	05/11/18 11:16	1

Lab Sample ID: LCS 550-145985/2-A  
Matrix: Water  
Analysis Batch: 146884

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 145985

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
ORO (C22-C32)	1.60	1.59		mg/L		99	69 - 107
DRO (C10-C22)	0.400	0.450		mg/L		113	42 - 133
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
o-Terphenyl (Surr)	79		10 - 150				

Lab Sample ID: LCSD 550-145985/3-A  
Matrix: Water  
Analysis Batch: 146884

Client Sample ID: Lab Control Sample Dup  
Prep Type: Total/NA  
Prep Batch: 145985

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
ORO (C22-C32)	1.60	1.59		mg/L		100	69 - 107	0	20
DRO (C10-C22)	0.400	0.447		mg/L		112	42 - 133	1	22
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
o-Terphenyl (Surr)	79		10 - 150						

## QC Association Summary

Client: Turner Laboratories, Inc.  
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

### GC Semi VOA

#### Prep Batch: 145985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	3510C	
MB 550-145985/1-A	Method Blank	Total/NA	Water	3510C	
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

#### Analysis Batch: 146884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	8015D	145985
MB 550-145985/1-A	Method Blank	Total/NA	Water	8015D	145985
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	8015D	145985
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	8015D	145985

# Lab Chronicle

Client: Turner Laboratories, Inc.  
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

**Client Sample ID: 18D0619-01**  
**Date Collected: 04/23/18 15:55**  
**Date Received: 04/27/18 10:50**

**Lab Sample ID: 550-101943-1**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			145985	04/30/18 14:16	REM	TAL PHX
Total/NA	Analysis	8015D		1	146884	05/10/18 23:29	TC1	TAL PHX

**Laboratory References:**  
TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

- 1
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Accreditation/Certification Summary

Client: Turner Laboratories, Inc.  
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-18
Analysis Method	Prep Method	Matrix	Analyte	

- 1
- 2
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- 10
- 11
- 12
- 13
- 14
- 15

## Method Summary

Client: Turner Laboratories, Inc.  
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method	Method Description	Protocol	Laboratory
8015D	Diesel Range Organics (DRO) (GC)	SW846	TAL PHX
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL PHX

### Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

# SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619

101943

## SENDING LABORATORY:

Turner Laboratories, Inc.  
2445 N. Coyote Drive, Ste #104  
Tucson, AZ 85745  
Phone: 520.882.5880  
Fax: 520.882.9788  
Project Manager: Kevin Brim

## RECEIVING LABORATORY:

TestAmerica Phoenix  
4625 East Cotton Center Boulevard Suite 189  
Phoenix, AZ 85540  
Phone : (602) 437-3340  
Fax:  
Please CC Kevin Brim Kbrim@turnerlabs.com

## Analysis

## Expires

## Laboratory ID

## Comments

Sample ID: 18D0619-01 Drinking Water Sampled: 04/23/2018 15:55

8015D Sub

04/30/2018 15:55

8015D DRO and ORO Paramaters Only

Containers Supplied:

## 8015D Sub

o-Terphenyl  
C10-C32 (Total)  
C22-C32 (Oil Range Organics)  
C10-C22 (Diesel Range Organics)  
C6-C10 (Gasoline Range Organics)

550-101943 Chain of Custody



TA-PHX

3.8 L  
LPS  
GVR

Released By

Date

Received By

Date

Released By

Date

Received By

Date

## Login Sample Receipt Checklist

Client: Turner Laboratories, Inc.

Job Number: 550-101943-1

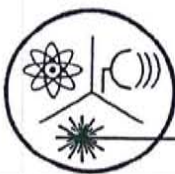
Login Number: 101943

List Source: TestAmerica Phoenix

List Number: 1

Creator: Gravlin, Andrea

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	Check done at department level as required.



## Radiation Safety Engineering, Inc.

3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121

(480) 897-9459

Website: www.radsafe.com

FAX (480) 892-5446

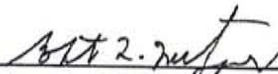
### Radiochemical Activity in Water (pCi/L)

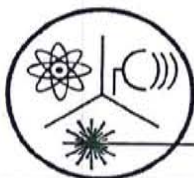
Turner Laboratories  
2445 N. Coyote Drive, Ste. 104  
Tucson, AZ 85745

Sampling Date: April 23, 2018  
Sample Received: May 01, 2018  
Analysis Completed: May 22, 2018

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Uranium Activity Method ASTM D6239 (pCi/L)	Adjusted Gross Alpha (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
18D0619-01	17.7 ± 0.9	12.9 ± 1.2	4.8 ± 1.5	3.1 ± 0.3	3.1 ± 0.4	6.2 ± 0.5

Date of Analysis	5/2/2018	5/21/2018	5/21/2018	5/4/2018	5/4/2018	5/4/2018
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 Robert L. Metzger, Ph.D., C.H.P.      5/22/2018  
 Date  
 Laboratory License Number AZ0462



## Radiation Safety Engineering, Inc.

3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121

Website: [www.radsafe.com](http://www.radsafe.com)

(480) 897-9459

FAX (480) 892-5446

### Isotopic Uranium Analysis

Turner Laboratories  
2445 N. Coyote Drive, Ste. 104  
Tucson, AZ 85745

Sampling Date: April 23, 2018

Sample Received: May 01, 2018

Uranium Analysis Date: May 21, 2018

Sample No.	$^{238}\text{U}$	$^{235}\text{U}$	$^{234}\text{U}$	Total	
18D0619-01	$6.0 \pm 0.6$	$0.280 \pm 0.004$	$6.6 \pm 0.6$	$12.9 \pm 1.2$	Activity (pCi/L)
	$17.9 \pm 1.7$	$0.131 \pm 0.002$	$0.00106 \pm 0.00010$	$18.0 \pm 1.7$	Content ( $\mu\text{g/L}$ )
	Comments:				

*Robert L. Metzger*  
Robert L. Metzger, Ph.D., C.H.P.

5/22/2018

Date

Laboratory License Number AZ0462

Arizona Department of Environmental Quality  
**Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report**  
 \*\*\*Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only\*\*\*

PWS ID#: AZ04

PWS Name: \_\_\_\_\_

April 23, 2018 15:55 (24 hour clock)

Sample Date

Sample Time

Owner/Contact Person

Owner/Contact Fax Number

Owner/Contact Phone Number

Sample Collection Point

☐ EPDS # \_\_\_\_\_**Compliance Sample Type:**☐

Reduced Monitoring

Date Q1 collected: \_\_\_\_\_

☐

Quarterly

Date Q2 collected: \_\_\_\_\_

☐

Composite of four quarterly samples

Date Q3 collected: \_\_\_\_\_

Date Q4 collected: \_\_\_\_\_

**\*\*\*RADIOCHEMICAL ANALYSIS\*\*\***

&gt;&gt;&gt;To be filled out by laboratory personnel&lt;&lt;&lt;

**\*\*\*Combined Uranium must be reported in micrograms per liter\*\*\***

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000	5/21/2018	4.8 ± 1.5	
600/00-02		3 pCi/L	Gross Alpha	4002	5/2/2018	17.7 ± 0.9	
7500 - Rn			Radon	4004			
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006	5/21/2018	18.0 ± 1.7 µg/L	
			Uranium 234	4007	5/21/2018	0.00106 ± 0.00010	
			Uranium 235	4008	5/21/2018	0.131 ± 0.002	
			Uranium 238	4009	5/21/2018	17.9 ± 1.7	
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	5/4/2018	6.2 ± 0.5	X
GammaRay HPGE		1 pCi/L	Radium 226	4020	5/4/2018	3.1 ± 0.3	
GammaRay HPGE		1 pCi/L	Radium 228	4030	5/4/2018	3.1 ± 0.4	

**\*\*\*LABORATORY INFORMATION\*\*\***

&gt;&gt;&gt;To be filled out by laboratory personnel&lt;&lt;&lt;

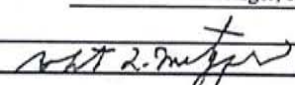
Specimen Number: RSE60312

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 18D0619-01

Authorized Signature: 

Date Public Water System Notified: \_\_\_\_\_

DWAR 6: 11/2007

## SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619

SENDING LABORATORY:

Turner Laboratories, Inc.  
 2445 N. Coyote Drive, Ste #104  
 Tucson, AZ 85745  
 Phone: 520.882.5880  
 Fax: 520.882.9788  
 Project Manager: Kevin Brim

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.  
 3245 N. Washington St.  
 Chandler, AZ 85225-1121  
 Phone : (480) 897-9459  
 Fax: (480) 892-5446  
 Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
<hr/>			
Sample ID: 18D0619-01 Drinking Water Sampled: 04/23/2018 15:55			
Radiochemistry, Gross Alpha	10/20/2018 15:55		Analyze Uranium and Adjusted Alpha if G. Alpha is > 12
Radiochemistry, Radium 226/228	05/23/2018 15:55		
Containers Supplied:			

4160312

Released By

Date

Received By

Date

Released By

Date

Received By

Date

## **APPENDIX D**

### **Well Completion Documentation**

## PIPE TALLY

Project Name.: <u>ECI</u>	Project No.: <u>129687-005</u>
Well No.: <u>0-07</u>	Date: <u>5-18-17</u>
Location:	Pipe Tally for:
Total Depth: <u>1210 (Grilled)</u>	Geologist: <u>Uford</u>

Type of Connections: ☐ Welded ☐ T+C ☒ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
1	✓	0.45	0.45	END CAP	-				
2	✓	20.00	20.45	PVC SCREEN	0.80	ERT	ERT 10	10-black	1196.41
3	✓	20.01	40.46		-				
4	✓	20.01	60.47		-				
5	✓	20.00	80.47		15.82	ERT	ERT 9	9-green	1121.37
6	✓	20.00	100.47		-				
7	✓	20.00	120.47		-				
8	✓	20.01	140.48		-				
9	✓	20.00	160.48		11.15	ERT	ERT 8	8-grey	1046.03
10	✓	20.01	180.49		-				
11	✓	20.01	200.50		-				
12	✓	20.00	220.50		-				
13	✓	20.00	240.50		6.28	ERT	ERT 7	7-blue	970.88
14	✓	20.00	260.50		-				
15	✓	20.01	280.51		-				
16	✓	20.03	300.54		-				
17	✓	20.01	320.55		1.45	ERT	ERT 6	6-white	895.67
18	✓	20.03	340.58		-				
19	✓	20.00	360.58		-				
20	✓	20.00	380.58		16.65	ERT	ERT 5	5-red	820.43
21	✓	20.02	400.60		-				
22	✓	20.02	420.62		-				
23	✓	20.07	440.69		-				
24	✓	20.13	460.82		11.76	ERT	ERT 4	4 brown	745.21
25	✓	20.06	480.88		-				
26	✓	20.02	500.90		-				
27	✓	20.07	520.97		-				
28	✓	19.98	540.95		6.68	ERT	ERT 3	3-yellow	670.01
29	✓	20.03	560.98		-				
30	✓	20.07	581.05		-				

Notes:

x = Centralizer (at bottom of pipe unless otherwise indicated)

Original #26 (was 20.06) found to have hole in screen & replaced. New length 20.02

## SUMMARY OF TALLY

Total Length tallied:	* 1198.65 / 1200.30
Casing Stick-Up:	* 0.99 / 2.64
Length of Casing Cut-Off:	<del>1197.66</del>
Bottom of Well:	1197.66
Screened Interval:	446 - 1197.66
Total Screen in Hole:	751.66
Sensor Types:	Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
	Conductivity Sensor (CS) single sensor with sing lead 20 ft spacing
	Operational Monitoring Sensor (OMS)

\* = Joint #57 (1.65 Ft) used to have room for well/casing to land casing. Removed after landing.

HALEY ALDRICH

## PIPE TALLY

Project Name.: <u>FCI</u>	Project No.: <u>129687-005</u>
Well No.: <u>0-07</u>	Date: <u>5-18-17</u>
Location:	Pipe Talley for:
Total Depth: <u>1210 (drilled)</u>	Geologist: <u>KFORD</u>

Type of Connections: ☐ Welded ☐ T+C ☒ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
31	✓	20.07	601.12	PVC SCREEN	1.76				
32	✓	20.07	621.19		1.76	GRT	GRT 2	2-lt.green	594.78
33	✓	20.04	641.23		-				
34	✓	20.07	661.30						
35	✓	20.08	681.38		16.77	GRT	GRT 1	1-orange	519.59
36	✓	20.09	701.47						
37	✓	20.07	721.54						
38	✓	20.08	741.62						
39	✓	10.04	751.66						
40	✓	0.50	752.16	ADAPTER					
41	✓	29.01	781.17	FIBER GLASS					
42	✓	29.01	810.18		CS 4,3	CS	CS4 + CS3		
43	✓	29.02	839.20			CS	CS 2,1,4		
44	✓	29.02	868.22			CS	3,2,1		
45	✓	29.04	897.26						
46	✓	29.06	926.32			ACD	ACD 2,1		
47	✓	29.05	955.37						
48	✓	29.10	984.47						
49	✓	29.21	1013.68						
50	✓	29.21	1042.89						
51	✓	29.09	1071.98						
52	✓	29.16	1101.14						
53	✓	29.10	1130.24						
54	✓	29.04	1159.28						
55	✓	29.24	1188.52						
56	✓	10.13	1198.65						
57	✓	1.65	1200.30						

Notes:

## SUMMARY OF TALLY

Total Length tallied: \_\_\_\_\_  
 Casing Stick-Up: \_\_\_\_\_  
 Length of Casing Cut-Off: \_\_\_\_\_  
 Bottom of Well: \_\_\_\_\_  
 Screened Interval: \_\_\_\_\_  
 Total Screen in Hole: \_\_\_\_\_

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing  
 Conductivity Sensor (CS) single sensor with sing lead 20 ft spacing  
 Operational Monitoring Sensor (OMS)

HALEY  
ALDRICH

# ESTIMATED ANNULAR MATERIAL RECORD

Project Name: FCT Project #: 129687-005 Date: 5-19-17  
Well No.: 0-07 Geologist: SHENSEL, KAREN

## ANNULAR VOLUME CALCULATIONS

Total Depth of Borehole [T]: \_\_\_\_\_ feet Total Cased Depth: \_\_\_\_\_ feet  
Borehole Diameter [D]: 12.25 inches Rat Hole Volume [R=(D<sup>2</sup>) 0.005454\*L]: \_\_\_\_\_ Ft<sup>3</sup>  
Screen Length [L<sub>s</sub>]: \_\_\_\_\_ feet Rat Hole Length [L<sub>r</sub>]: \_\_\_\_\_ feet  
Screen Diameter [d<sub>s</sub>]: 5.56 inches Camera Tube Length [L<sub>ct</sub>]: \_\_\_\_\_ feet  
Casing Length [L<sub>c</sub>]: \_\_\_\_\_ feet Camera Tube Diameter [d<sub>ct</sub>]: \_\_\_\_\_ inches  
Casing Diameter [d<sub>c</sub>]: 5.31 inches

Screen Annular Volume (A<sub>s</sub>): (D<sup>2</sup>-d<sub>s</sub><sup>2</sup>) 0.005454 = 0.65 Ft<sup>3</sup>/Lin. Ft  
Casing Annular Volume (A<sub>c</sub>): (D<sup>2</sup>-d<sub>c</sub><sup>2</sup>) 0.005454 = 0.66 Ft<sup>3</sup>/Lin. Ft  
Casing/Cam.Tube Annular Volume (A<sub>c+ct</sub>): (D<sup>2</sup>-d<sub>c</sub><sup>2</sup>-d<sub>ct</sub><sup>2</sup>) 0.005454 = \_\_\_\_\_ Ft<sup>3</sup>/Lin. Ft

## EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet

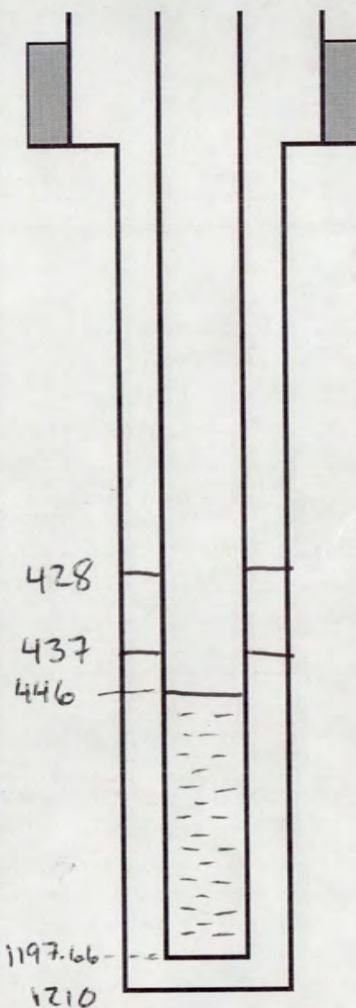
Bentonite Sack = 0.69 ft<sup>3</sup>

<sup>1</sup> Volume of bag (Ft<sup>3</sup>) = bag weight/100

Silica Sand Super Sack = 3000 lbs.

<sup>2</sup> Calculated depth = Previous Calculated depth - (v/A)

No.	✓	Weight of Bag (lbs.)	Volume of Bag <sup>1</sup> (v) (ft <sup>3</sup> )	Total Vol. of Bags (ft <sup>3</sup> )	Calculated Depth <sup>2</sup> (ft bls)	Tagged Depth (ft bls)	Comments
1	✓	3000	30	30	1164.7	-	PREMIUM SILICA 8x12
2	✓	3000	30	60	1130.89	1094	
3	✓	3000	30	90	1047.85	-	
4	✓	3000	30	120	1001.7	996	
5	✓	3000	30	150	958.55	-	
6	✓	3000	30	180	907.4	897	
7	✓	3000	30	210	850.85	-	



40' surface casing Annular Volume = 33.6 Ft<sup>3</sup>

as of 5/19/17 SAM, 20 Super Sks filter pack on hand.

46.15 lift per bag of gravel

HALEY  
ALDRICH

## ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: FCI

Project No.: 129687 -005

Geologist: S. Hensel K-Ford

Well No.: 0-07

Date: 5-19-17

[illegible]

Notes:



54019835

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
D12/4112	653	7A	850	891			

Customer Code:	Customer Name:	Customer Job Number:	Order Code / Date:
3181157	FLORENCE COPPER INC	FLORENCE WELL	5088 05/20/17
Project Code:	Project Name:	Project P.O. Number:	Order P.O. Number:
41097304	FLORENCE WELL	NO	FLORENCE WELL
Ticket Date:	Delivery Address:	Map Page:	Map/Row/Column:
05/20/17	1575 W HUNT HIGHWAY		PIN PINMY201
Delivery Instructions:	Dispatcher:		Ticket Number:
HUNT HWY & E/ FELIX RD. MAX	dheesley		44148976

Due On Job:	Slump:	Truck Number:	Driver Number:	Driver Name:	End Use:
08:00	11.00	10032098	411193	SCHAEFFER, BRANDON	SLU BLDNG: OTHER

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
6.00	6.00	18.00	1333049	TYPE II/V SLURRY 21 SK CMT/W YD3			
				LEGACY MATERIAL NO:			
1.00	1.00	1.00	1349968	PER DAY DELIVERY	EA		
1.00			1247818	FUEL SURCHARGE ADJ			
1.00			1202749	ENVIRONMENTAL FEE			
1.00			1572392	FREIGHT_NON_TAXABLE_ARIZONA			

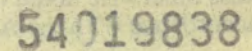
<input type="checkbox"/> Cash	Check # / Auth Code:	Signature of Driver Receiving Cash:	Cash Received:	Total COD Order Amount to Collect Without Standby Charges:
<input type="checkbox"/> Check				
<input type="checkbox"/> Charge				
Comments: Hunt Hwy E Felix Rd		WATER ADDED: _____ GAL YARDS IN DRUM: _____ WHEN ADDED.		
		SIGNATURE		
		CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST:		
		SIGNATURE		
		<input type="checkbox"/> LOAD WAS TESTED BY: _____		

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

**SPECIAL TERMS:** Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING:** Product may cause skin and/or eye irritation. **CAUTION:** Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

**AUTHORIZED SIGNATURE:**

(X)



Customer Code:	Customer Name:	Customer Job Number:	Order Code / Date:
3181157	FLORENCE COPPER INC	FLORENCE WELL	6088 05/20/17
Project Code:	Project Name:	Project P.O. Number:	Order P.O. Number:
41097304	FLORENCE WELL	NO	FLORENCE WELL
Ticket Date:	Delivery Address:	Map Page:	Map/Row/Column:
05/20/17	1575 W HUNT HIGHWAY	TYPE II/V C	PIN PINMY201
Delivery Instructions:	HUNT HWY & E/ FELIX RD. MAX		Dispatcher: dreesley
			Ticket Number: 44149031

Due On Job: 08:22	Slump: 11.00	Truck Number: 10032179	Driver Number: 411180	Driver Name: YATES, DONALD	End Use: SLU BLDNG: OTHER
----------------------	-----------------	---------------------------	--------------------------	-------------------------------	------------------------------

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
6.00	12.00	18.00	1333049	TYPE II/V SLURRY 21 SK CMT/W YD3			
LEGACY MATERIAL NO:							
MAY 20 AM 7:30							
1.00			1247818	FUEL SURCHARGE ADJ			
1.00			1202749	ENVIRONMENTAL FEE			
1.00			1572392	FREIGHT_NON_TAXABLE_ARIZONA			

<input type="checkbox"/> Cash	Check # / Auth Code:	Signature of Driver Receiving Cash:	Cash Received:	Total COD Order Amount to Collect Without Standby Charges:
<input type="checkbox"/> Check				
<input type="checkbox"/> Charge				
Comments:			WATER ADDED: _____ GAL      YARDS IN DRUM: _____ WHEN ADDED. _____ _____ SIGNATURE  CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST: _____ SIGNATURE  <input type="checkbox"/> LOAD WAS TESTED      BY: _____	

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

**SPECIAL TERMS:** Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING:** Product may cause skin and/or eye irritation. **CAUTION:** Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

**AUTHORIZED SIGNATURE:**

(X)



54019840

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
D12/4112	8:10	8:15	9:41	10:19	10:24		

Customer Code: 31811	Customer Name: FLORENCE COPPER INC	Customer Job Number: FLORENCE WELL	Order Code / Date: 6088 05/20/17
Project Code: 41097304	Project Name: FLORENCE WELL	Project P.O. Number: NO	Order P.O. Number: FLORENCE WELL
Ticket Date: 05/20/17	Delivery Address: 1575 W HUNT HIGHWAY	Map Page: TYPE II/V C	Map/Row/Column: PIN PINMY201
Delivery Instructions: HUNT HWY & E/ FELIX RD. MAX			Dispatcher: dreesley
			Ticket Number: 44149098

Due On Job: 08:58	Slump: 11.00	Truck Number: 1006302	Driver Number: 41280	Driver Name: ROBERT HUTH	End Use: SLU BLDNG: OTHER
----------------------	-----------------	--------------------------	-------------------------	-----------------------------	------------------------------

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
67.00	18.00	18.00	1333049	TYPE II/V SLURRY 21 SK CMT/W YD3			
				LEGACY MATERIAL NO:			
4.00			1247818	FUEL SURCHARGE ADJ			
1.00			1202749	ENVIRONMENTAL FEE			
1.00			1572392	FREIGHT_NON_TAXABLE_ARIZONA			

<input type="checkbox"/> Cash <input type="checkbox"/> Check <input type="checkbox"/> Charge	Check # / Auth Code: _____	Signature of Driver Receiving Cash: _____	Cash Received: _____	Total COD Order Amount to Collect Without Standby Charges: _____
Comments: _____			WATER ADDED: _____ GAL YARDS IN DRUM: _____ WHEN ADDED. _____ SIGNATURE CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST: _____ SIGNATURE <input type="checkbox"/> LOAD WAS TESTED BY: _____	

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

**SPECIAL TERMS:** Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING:** Product may cause skin and/or eye irritation. **CAUTION:** Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

**AUTHORIZED SIGNATURE:**

(X)

## **APPENDIX E**

### **Geophysical Logs**



# Southwest Exploration Services, LLC

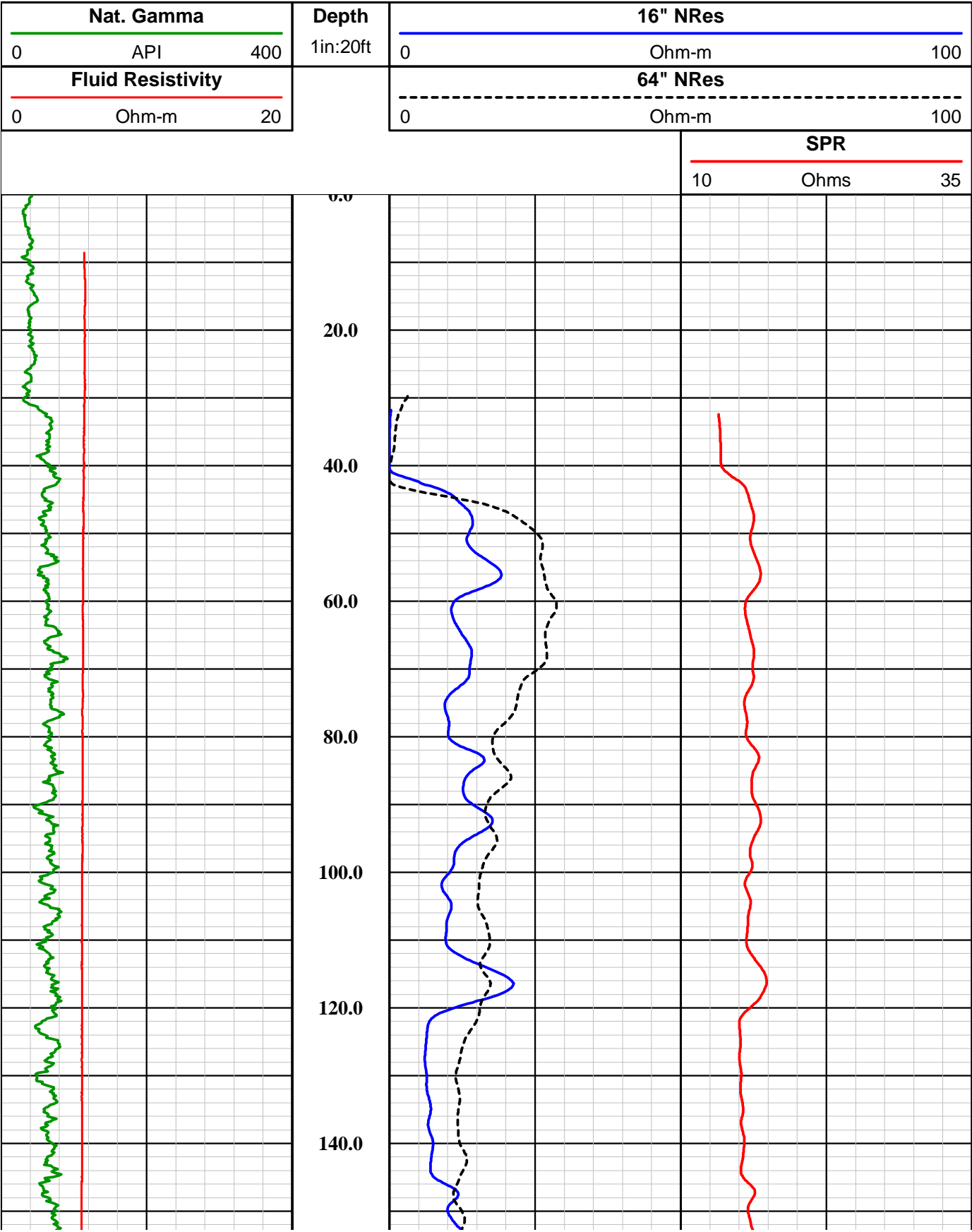
borehole geophysics & video services

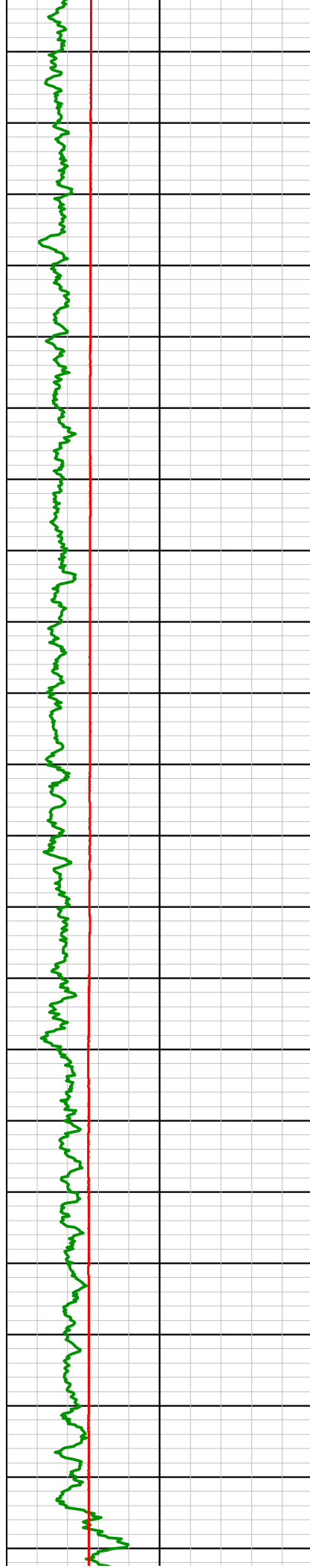
COMPANY		FLORENCE COPPER	
WELL ID	O-07		
FIELD	FLORENCE COPPER		
COUNTY	PINAL	STATE	ARIZONA
TYPE OF LOGS: E-LOGS MORE: NAT. GAMMA LOCATION		OTHER SERVICES SONIC DEVIATION CALIPER TEMPERATURE FLUID RESISTIVITY	
SEC	TWP	RGE	
PERMANENT DATUM		ELEVATION	
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	
DRILLING MEAS. FROM	GROUND LEVEL	G.L.	
DATE	5-18-17	TYPE FLUID IN HOLE	MUD
RUN No	2	MUD WEIGHT	N/A
TYPE LOG	E-LOGS - GAMMA	VISCOSITY	N/A
DEPTH-DRILLER	1210 FT.	LEVEL	FULL
DEPTH-LOGGER	1202 FT.	MAX. REC. TEMP.	30.87 DEG. C
BTM LOGGED INTERVAL	1202 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	NATIONAL	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	D. ECKMAN	TOOL STRING/SN	ALT QL E-LOG SN 6355
WITNESSED BY	CHAD - H & A	LOG TIME: ON SITE/OFF SITE	0730 1630
BOREHOLE RECORD		CASING RECORD	
NO.	BIT	FROM	TO
1	? SURFACE	40 FT.	14 IN.
2	12 1/4 IN.	40 FT.	TOTAL DEPTH
3			
COMMENTS:			

<b>Tool Summary:</b>					
Date	5-18-17	Date	5-18-17	Date	5-18-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	ALT E-LOG	Tool Model	MSI 60MM SONIC
Tool SN	4183	Tool SN	6355	Tool SN	6003
From	SURFACE	From	SURFACE	From	SURFACE
To	1202 FT.	To	1202 FT.	To	1204 FT.
Recorded By	D. ECKMAN	Recorded By	D. ECKMAN	Recorded By	D. ECKMAN
Truck No	900	Truck No	900	Truck No	900
Operation Check	5-17-17	Operation Check	5-18-17	Operation Check	5-18-17
Calibration Check	5-17-17	Calibration Check	5-18-17	Calibration Check	N/A
Time Logged	1015	Time Logged	1125	Time Logged	1200
Date	5-18-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI 2DVA-1000	Tool Model		Tool Model	
Tool SN	3082	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1200 FT	To		To	
Recorded By	D. ECKMAN	Recorded By		Recorded By	
Truck No	900	Truck No		Truck No	
Operation Check	5-18-17	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	1340	Time Logged		Time Logged	
<b>Additional Comments:</b>					
Caliper Arms Used: 15 IN. Calibration Points: 6 IN. & 24 IN.					

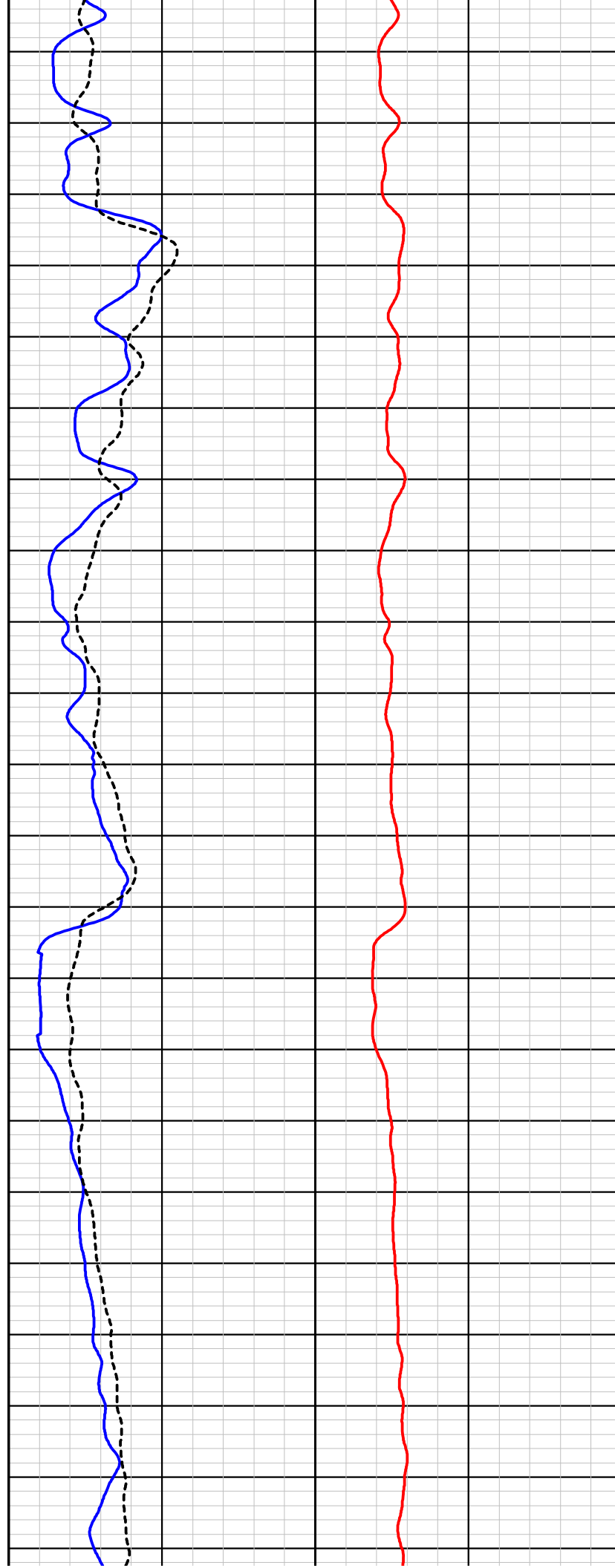
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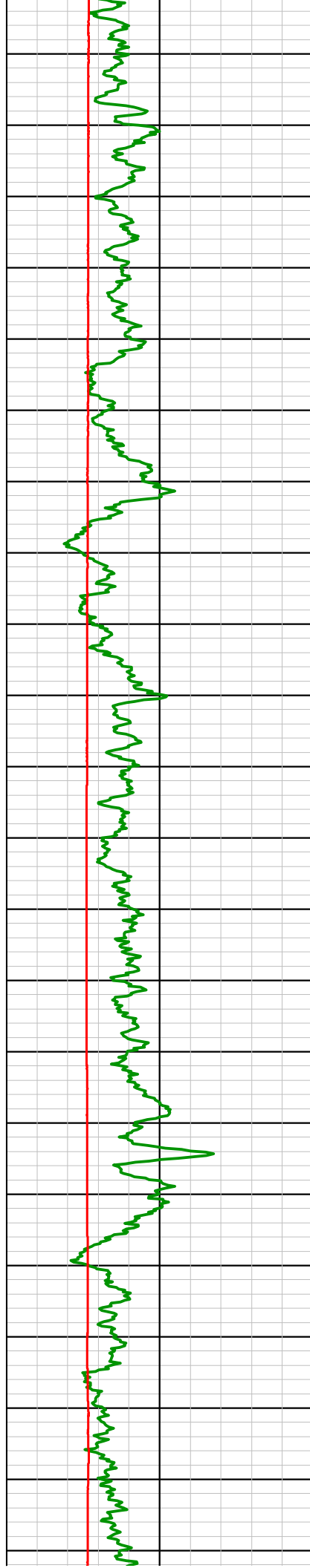
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.





160.0  
180.0  
200.0  
220.0  
240.0  
260.0  
280.0  
300.0  
320.0  
340.0  
360.0





380.0

400.0

420.0

440.0

460.0

480.0

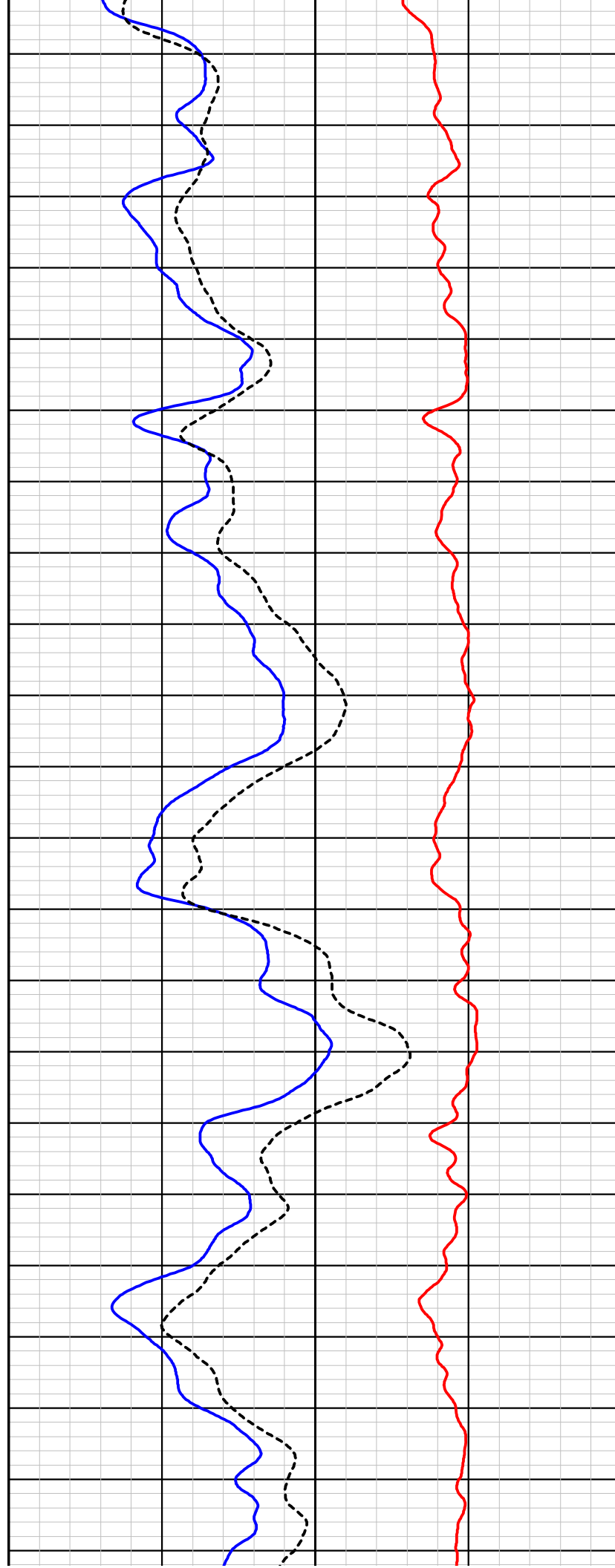
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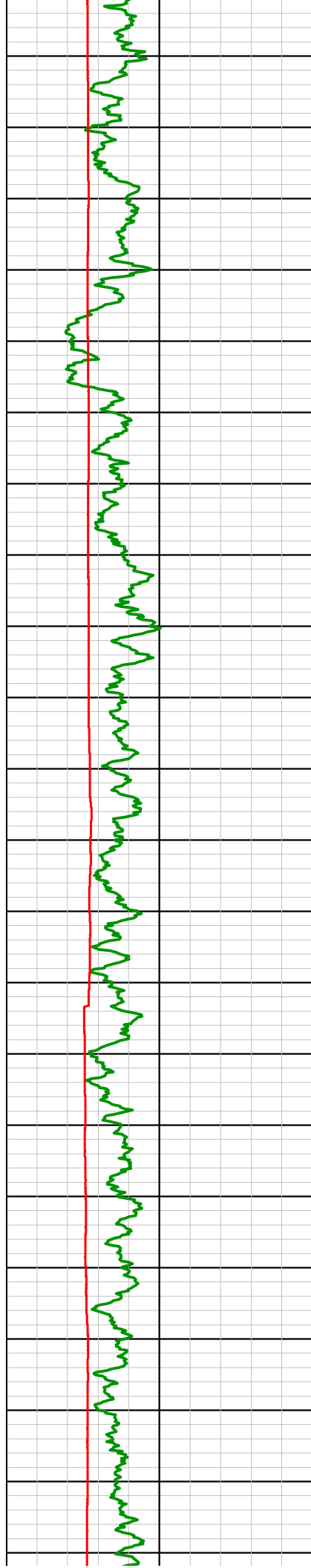
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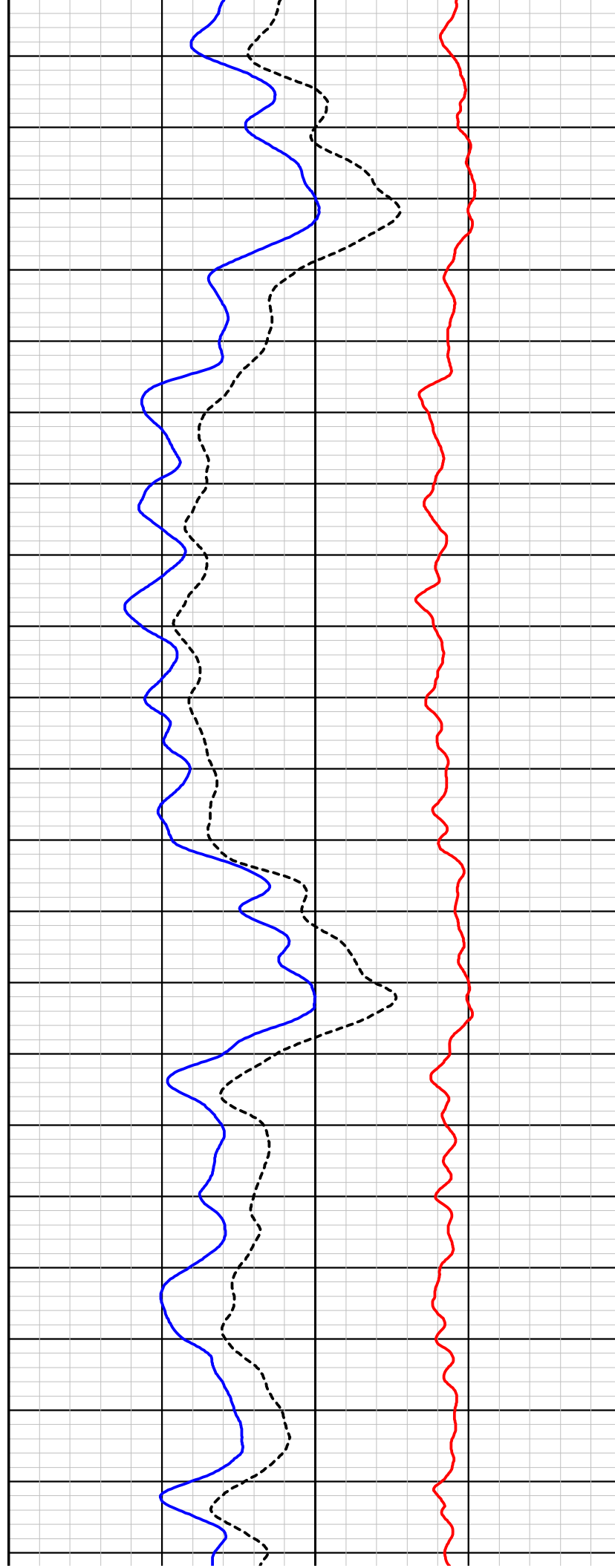
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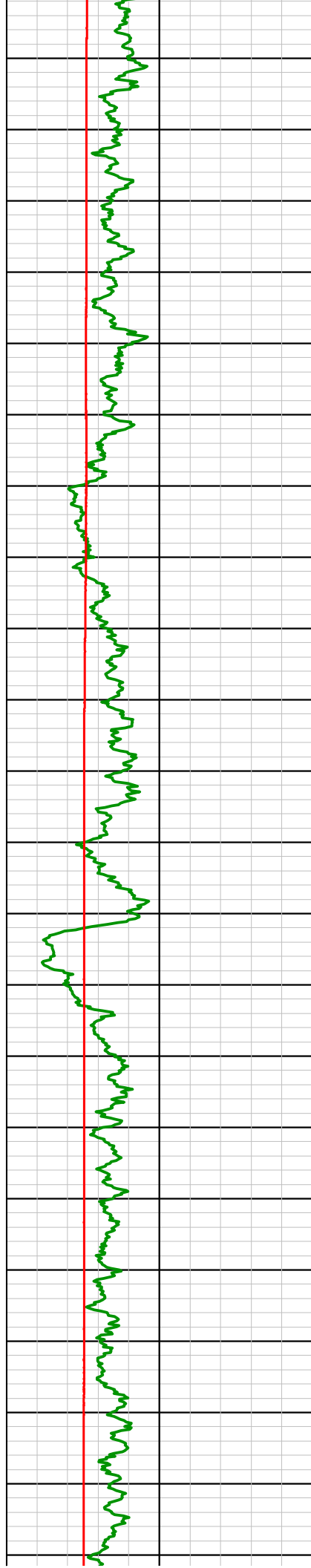
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820.0

840.0

860.0

880.0

900.0

920.0

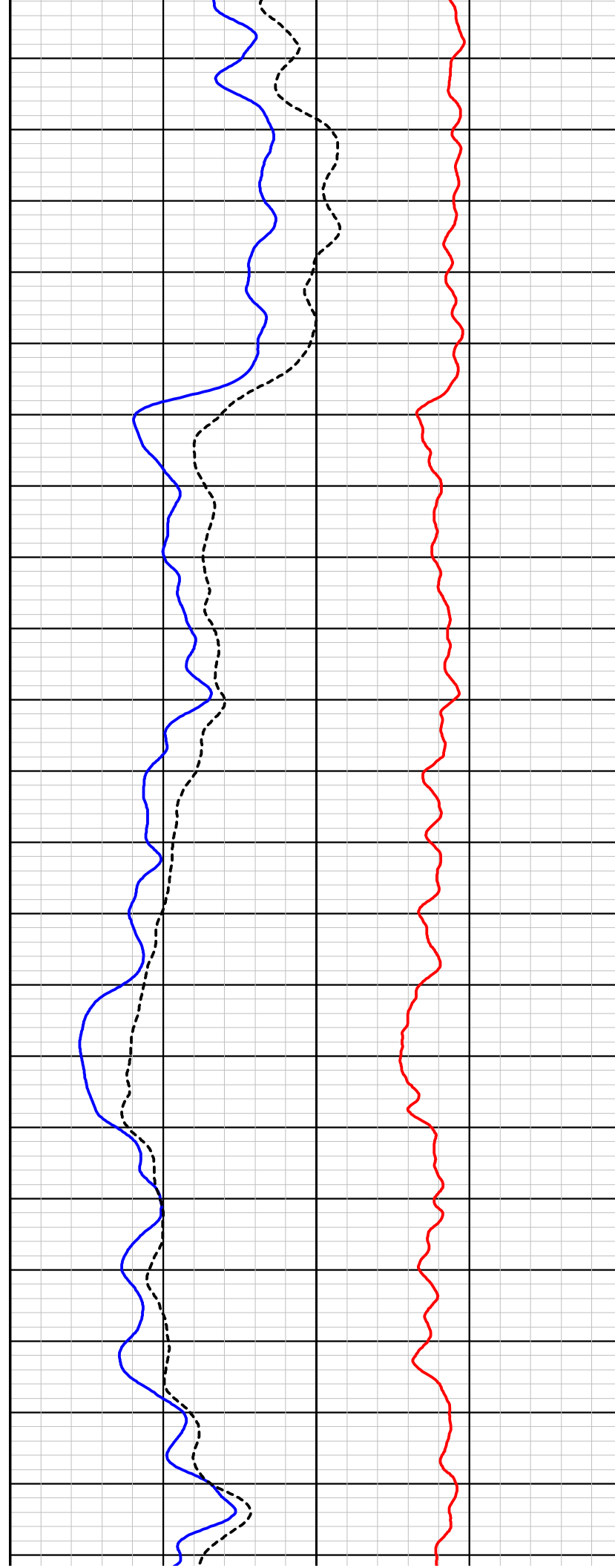
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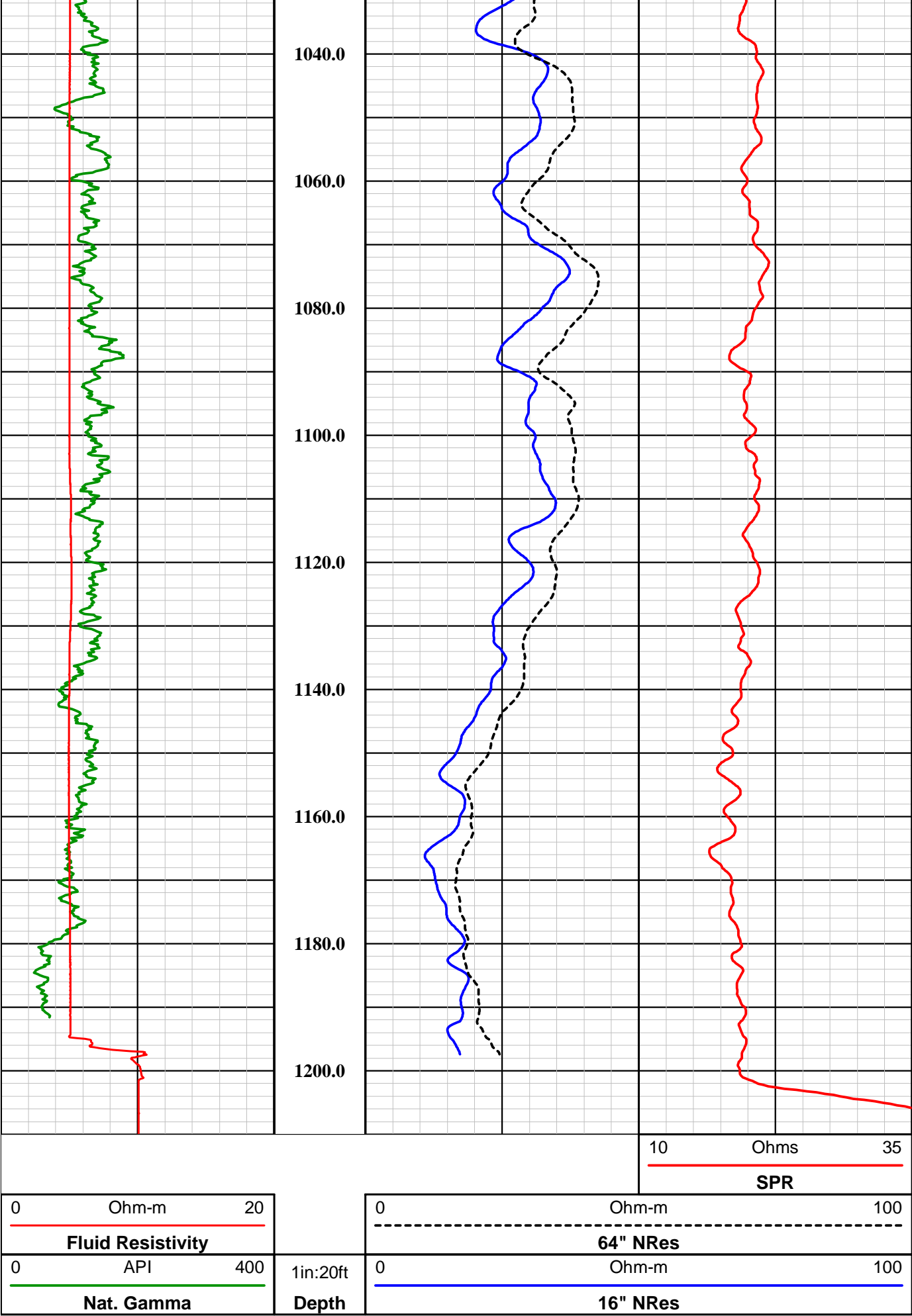
960.0

980.0

1000.0

1020.0





Probe Top = Depth Ref.

Tool SN: 6355

Bridle connects to wireline cablehead: Wireline armor is the B Electrode.

64" Normal Resistivity Electrode/Spontaneous Potential Electrode (M Electrode)

Probe Length = 1.89 m or 6.2 ft  
Bridle Length = 7.88 m or 25.86 ft

Probe Weight = 8.8 kg or 19.4 lbs

Can only be collected in fluid  
May be stacked with other QL tools

Operating Temperature: 80 Deg C (176 Deg F)  
Pressure Rating: 200 bar (2900 psi)

32" Normal Resistivity Electrode (M Electrode)

Electrode Measuring Points (from bottom of probe)

Spontaneous Potential (SP): 1.689 m or 5.54 ft

8" Normal Resistivity (8" NRes): 0.164 m or 0.54 ft

16" Normal Resistivity (16" NRes): 0.266 m or 0.87 ft

32" Normal Resistivity (32" NRes): 0.469 m or 1.54 ft

64" Normal Resistivity (64" NRes): 0.875 m or 2.87 ft

Single Point Resistance (SPR): 0.063 m or 0.21 ft

16" Normal Resistivity Electrode (M Electrode)

Isolation Bridle

8" Normal Resistivity Electrode (M Electrode)

Bridle Electrode (N Electrode)

Current Electrode/Single Point Resistance Electrode (A Electrode)

Four Conductor MSI Probe Top

1.63" or 40 mm Diameter (41.4 mm with neoprene heat shrink and electrical tape)

# MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

\*NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized\*

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



**Southwest Exploration  
Services, LLC**

borehole geophysics & video services

Company FLORENCE COPPER

Well O-07

Field FLORENCE COPPER

County PINAL

State ARIZONA

**Final**

**E-LOG Summary**



# Southwest Exploration Services, LLC

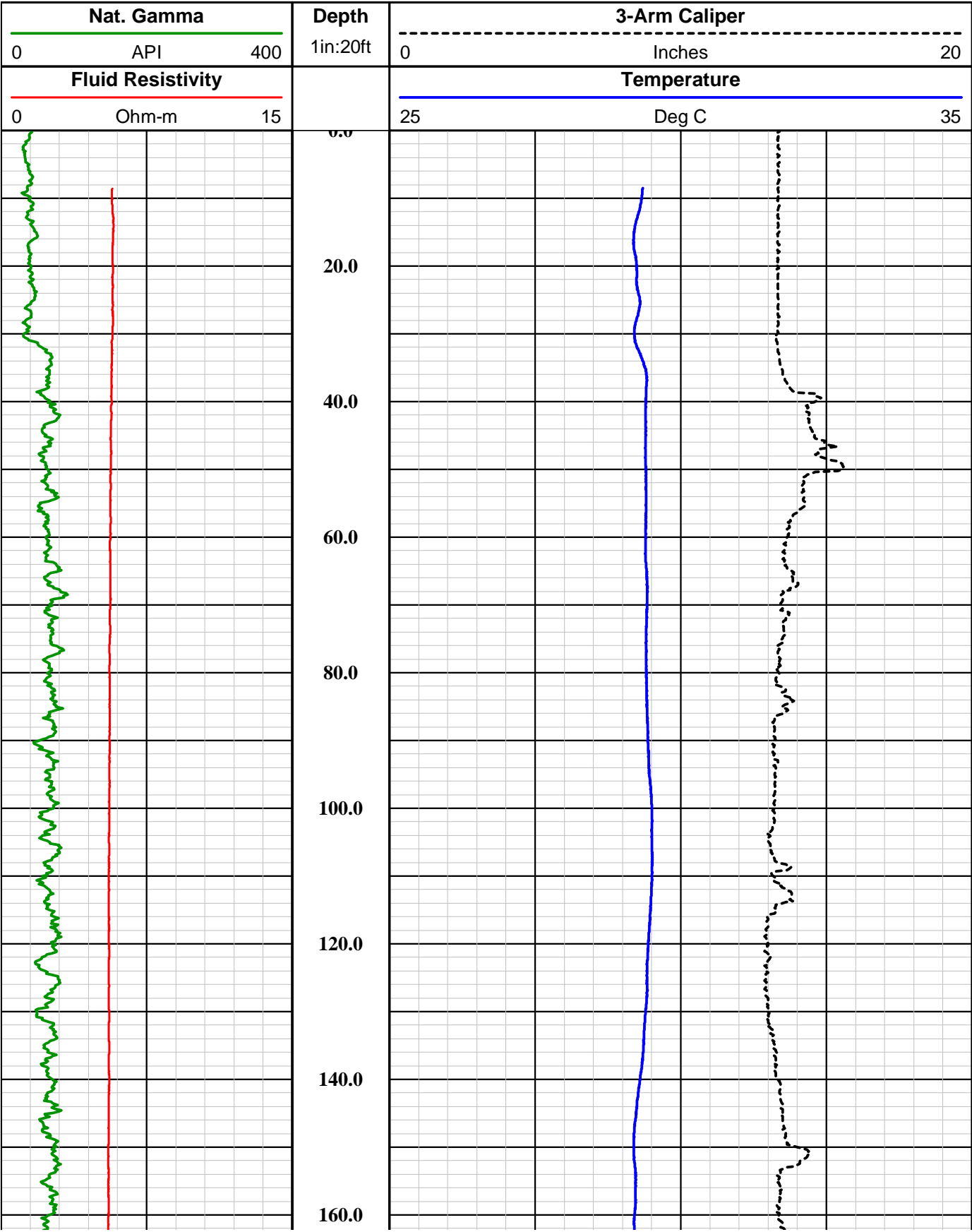
borehole geophysics & video services

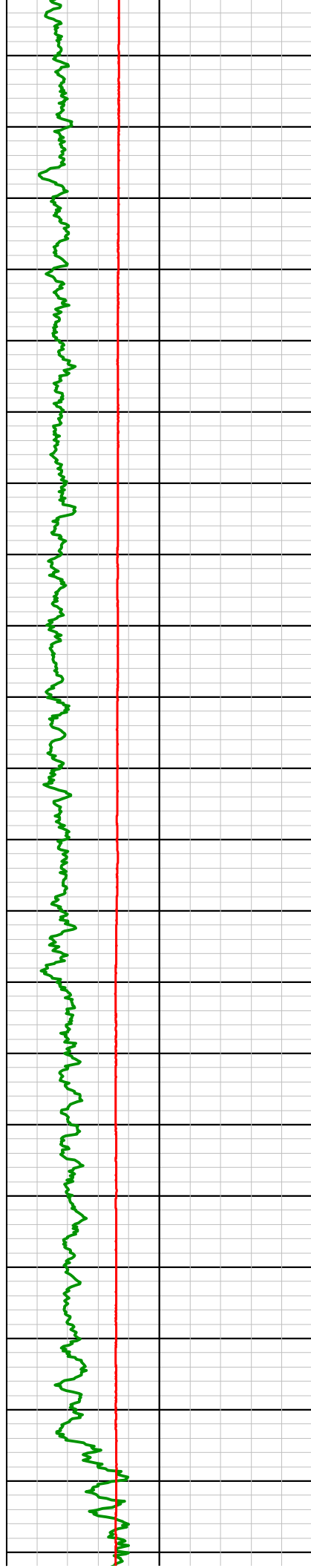
COMPANY FLORENCE COPPER							
WELL ID		O-07					
FIELD		FLORENCE COPPER					
COUNTY	PINAL	STATE ARIZONA					
TYPE OF LOGS: GAMMA-CALIPER MORE: TEMP-FLUID RES.		OTHER SERVICES E-LOGS SONIC DEVIATION					
LOCATION							
PERMANENT DATUM	SEC	TWP	RGE				
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM		K.B. D.F. G.L.			
DRILLING MEAS. FROM	GROUND LEVEL						
DATE	5-18-17	TYPE FLUID IN HOLE	MUD				
RUN No	2	MUD WEIGHT	N/A				
TYPE LOG	GAMMA-CALIPER- TPR	VISCOSITY	N/A				
DEPTH-DRILLER	1210 FT.	LEVEL	FULL				
DEPTH-LOGGER	1202 FT.	MAX. REC. TEMP.	30.87 DEG. C				
BTM LOGGED INTERVAL	1202 FT.	IMAGE ORIENTED TO:	N/A				
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT				
DRILLER / RIG#	NATIONAL	LOGGING TRUCK	TRUCK #900				
RECORDED BY / Logging Eng.	D. ECKMAN	TOOL STRING/SN	MSI COMBO TOOL, SN 4183				
WITNESSED BY	CHAD - H & A	LOG TIME:ON SITE/OFF SITE	0730	1630			
RUN BOREHOLE RECORD		CASING RECORD					
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	14 IN.	STEEL	SURFACE	40 FT.
2	12 1/4 IN.	40 FT.	TOTAL DEPTH				
3							
COMMENTS:							

<b>Tool Summary:</b>					
Date	5-18-17	Date	5-18-17	Date	5-18-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	ALT E-LOG	Tool Model	MSI 60MM SONIC
Tool SN	4183	Tool SN	6355	Tool SN	6003
From	SURFACE	From	SURFACE	From	SURFACE
To	1202 FT.	To	1202 FT.	To	1204 FT.
Recorded By	D. ECKMAN	Recorded By	D. ECKMAN	Recorded By	D. ECKMAN
Truck No	900	Truck No	900	Truck No	900
Operation Check	5-17-17	Operation Check	5-18-17	Operation Check	5-18-17
Calibration Check	5-17-17	Calibration Check	5-18-17	Calibration Check	N/A
Time Logged	1015	Time Logged	1125	Time Logged	1200
Date	5-18-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI 2DVA-1000	Tool Model		Tool Model	
Tool SN	3082	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1200 FT	To		To	
Recorded By	D. ECKMAN	Recorded By		Recorded By	
Truck No	900	Truck No		Truck No	
Operation Check	5-18-17	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	1340	Time Logged		Time Logged	
<b>Additional Comments:</b>					
Caliper Arms Used: 15 IN.			Calibration Points: 6 IN. & 24 IN.		

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200.0

220.0

240.0

260.0

280.0

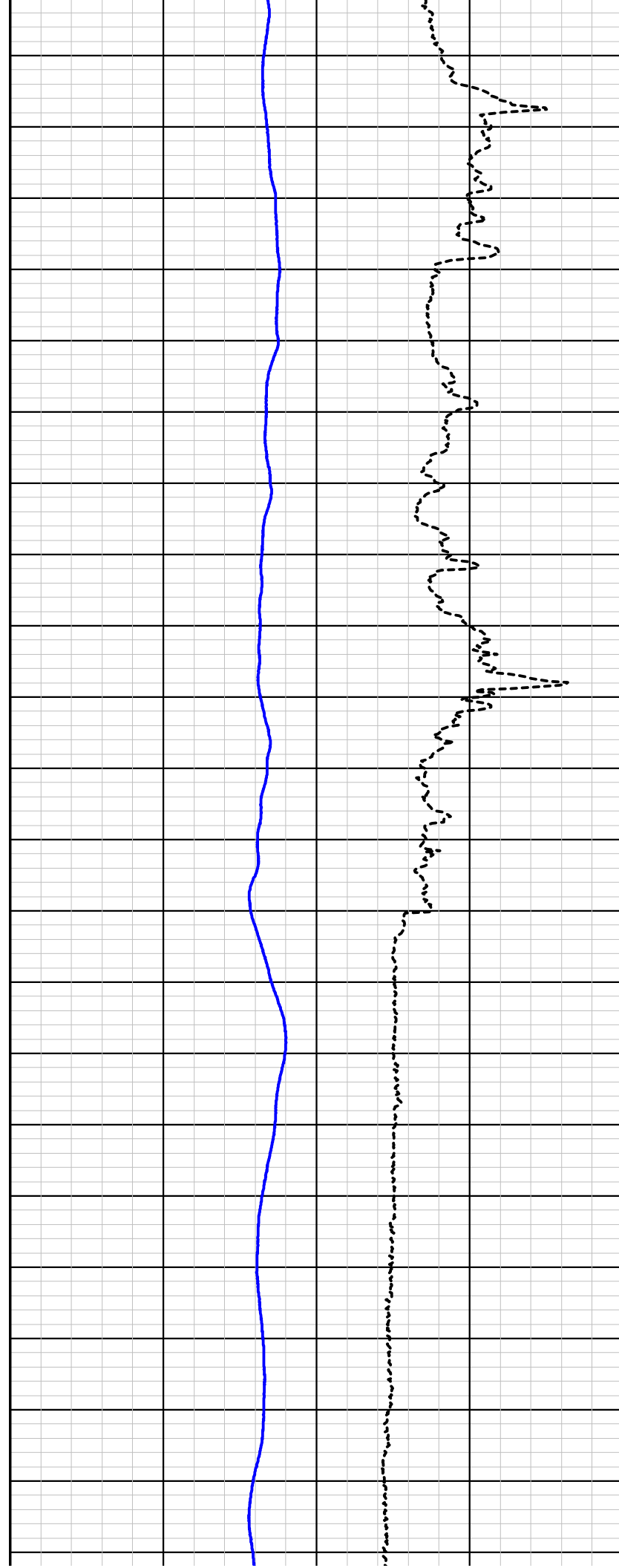
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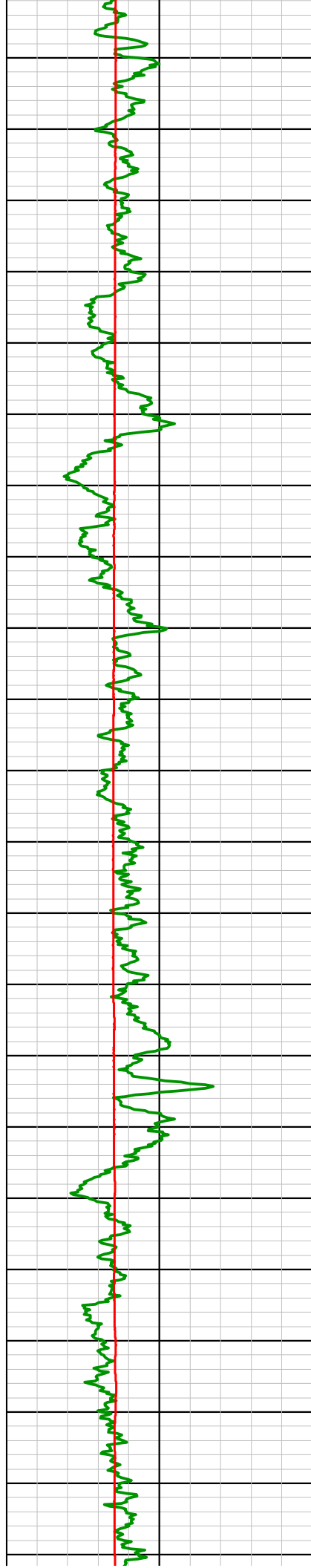
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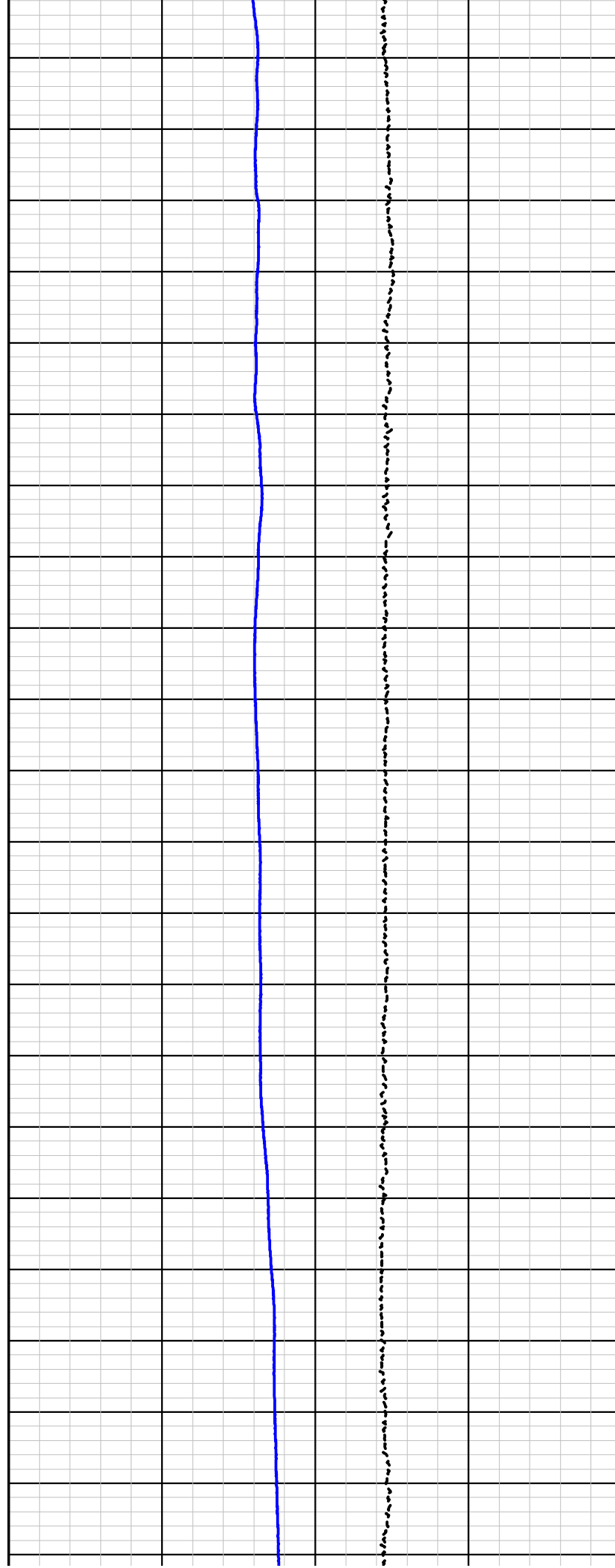
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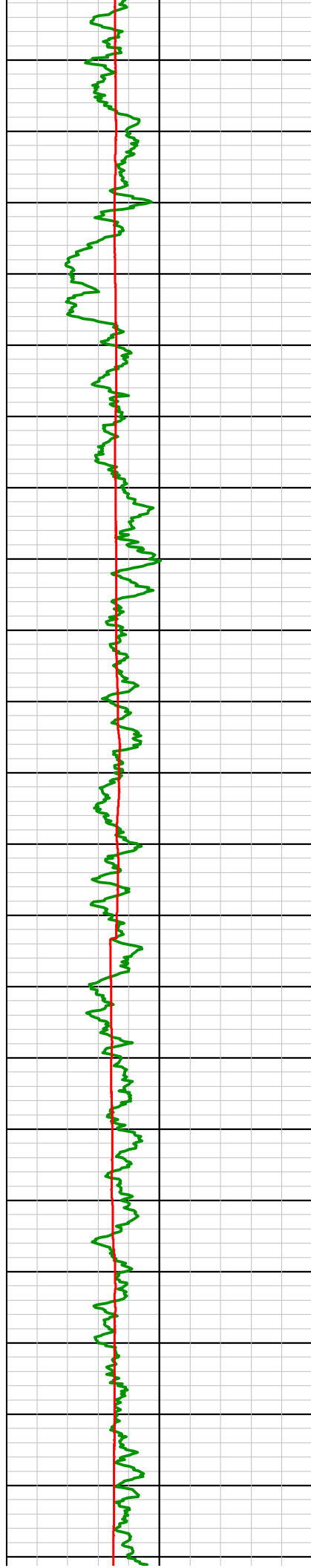
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700.0

720.0

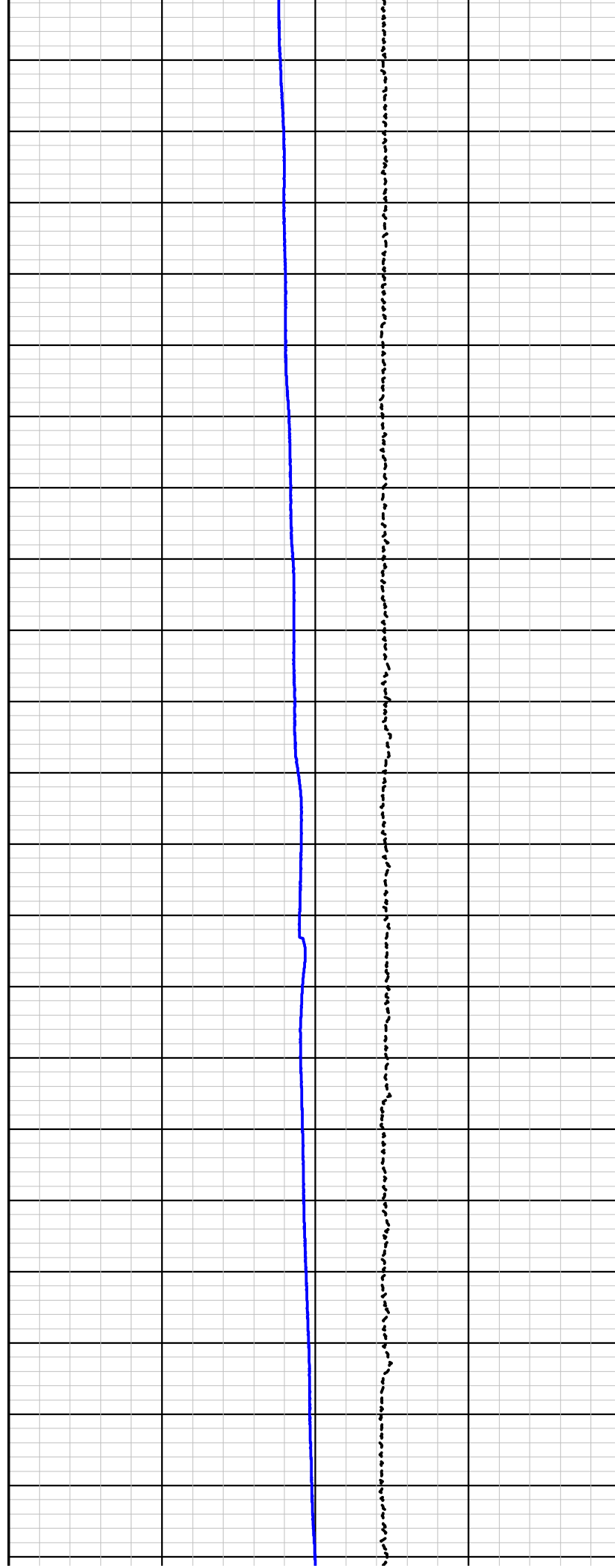
740.0

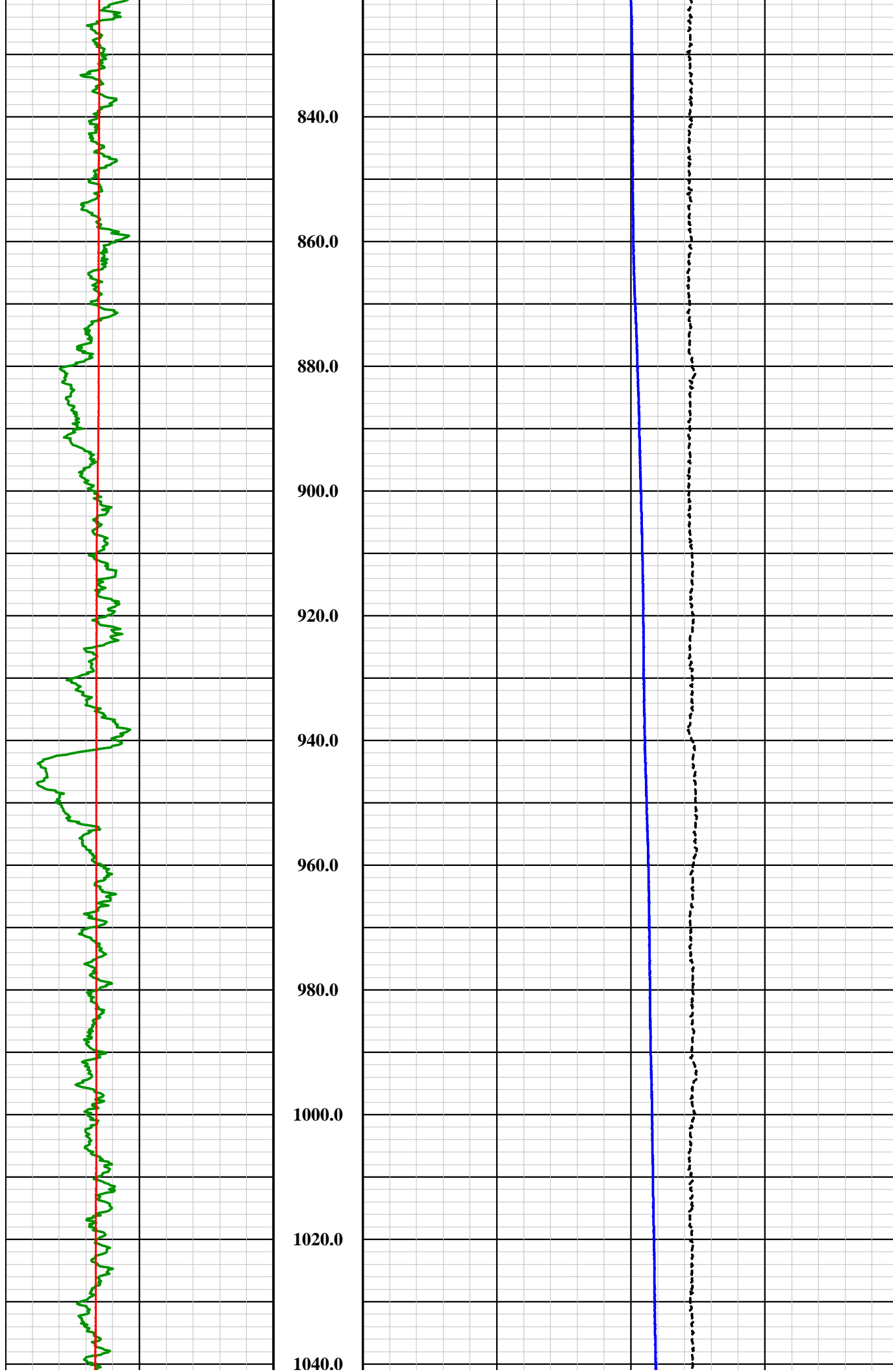
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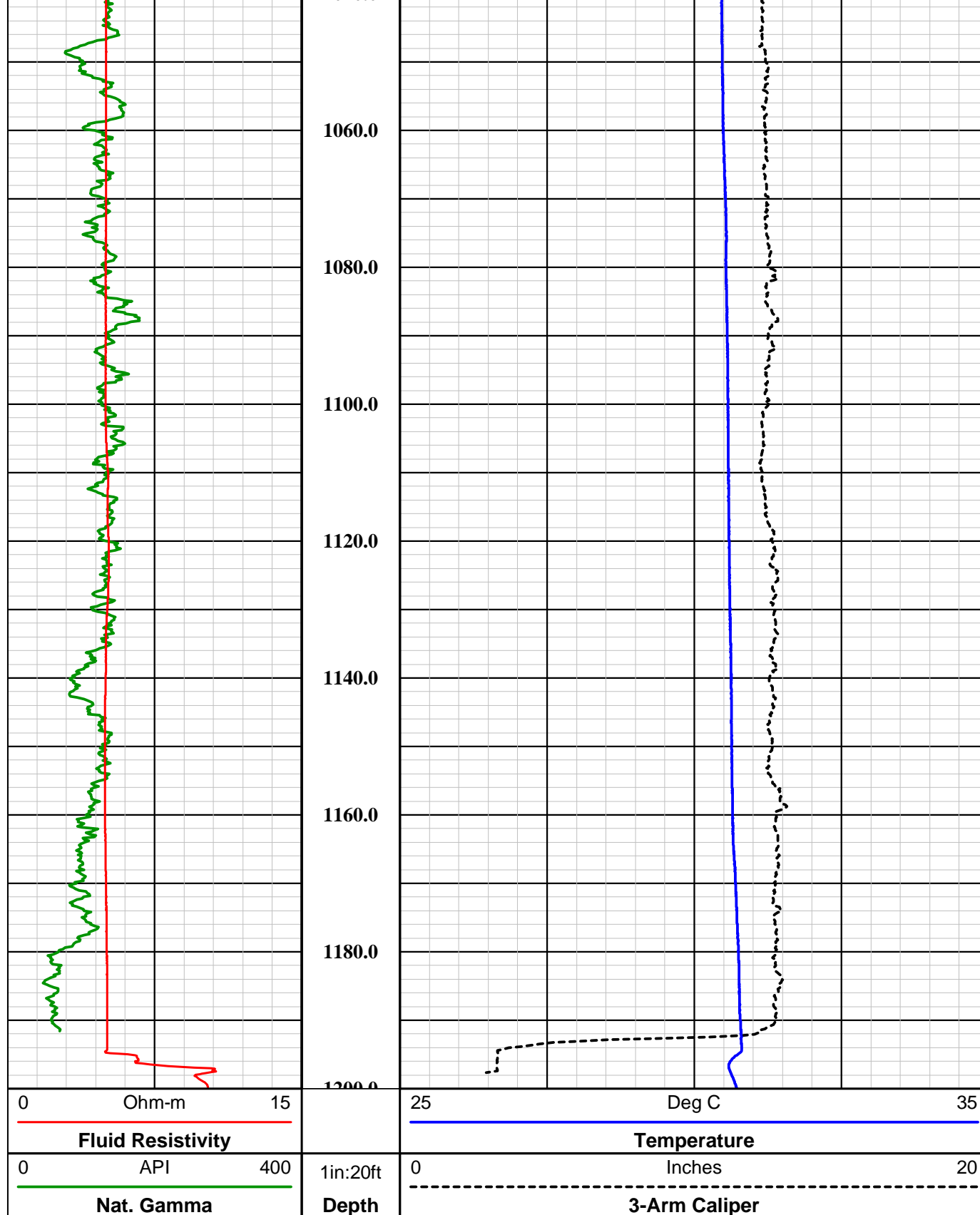
780.0

800.0

820.0







## MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

————— Natural Gamma Ray = 0.76 m (29.75 in)

**\*NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized\***

————— 3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

————— TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



**Southwest Exploration  
Services, LLC**

borehole geophysics & video services

Company

FLORENCE COPPER

Well

O-07

Field

FLORENCE COPPER

County

PINAL

State

ARIZONA

**Final**

**GCT Summary**



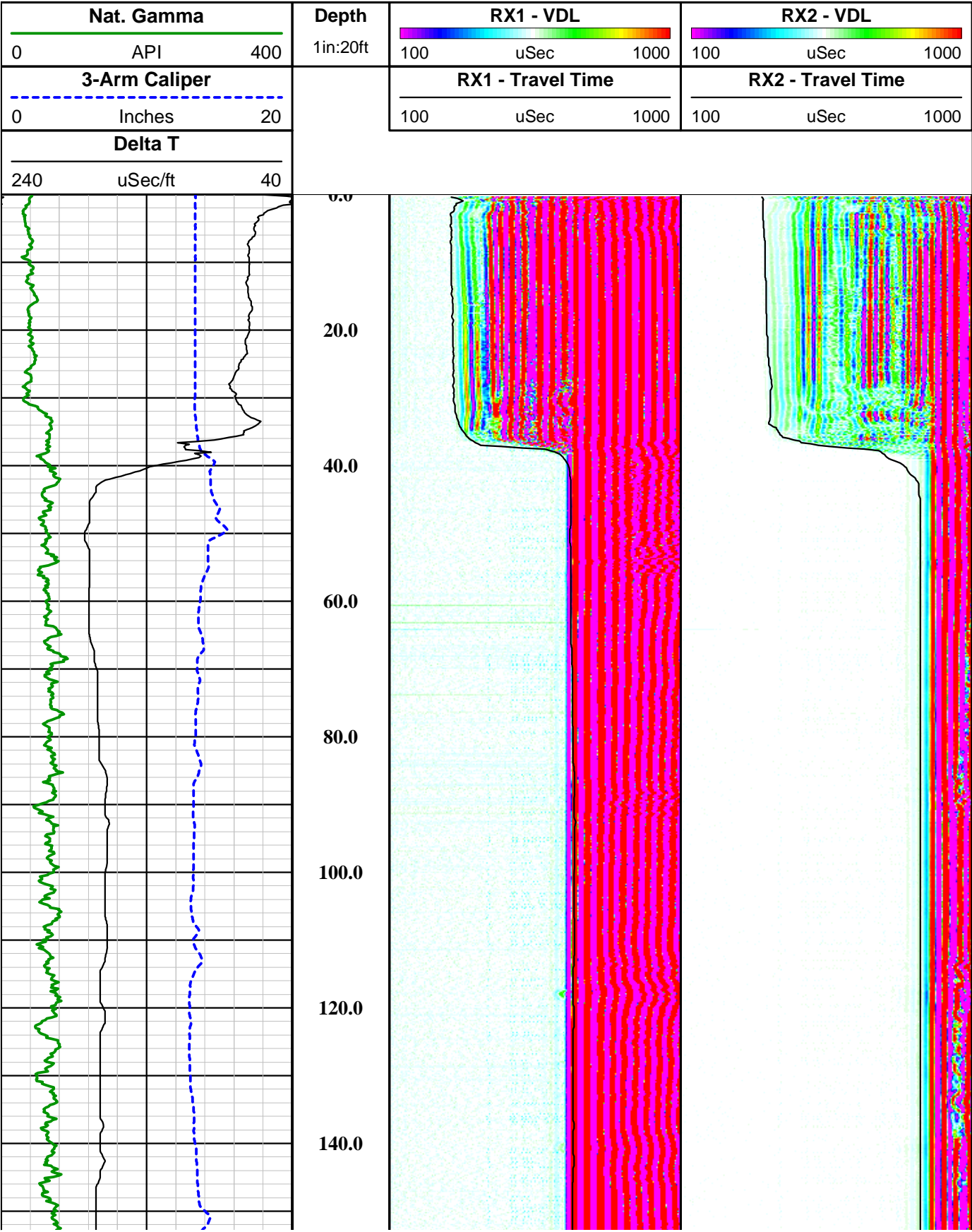
# Southwest Exploration Services, LLC

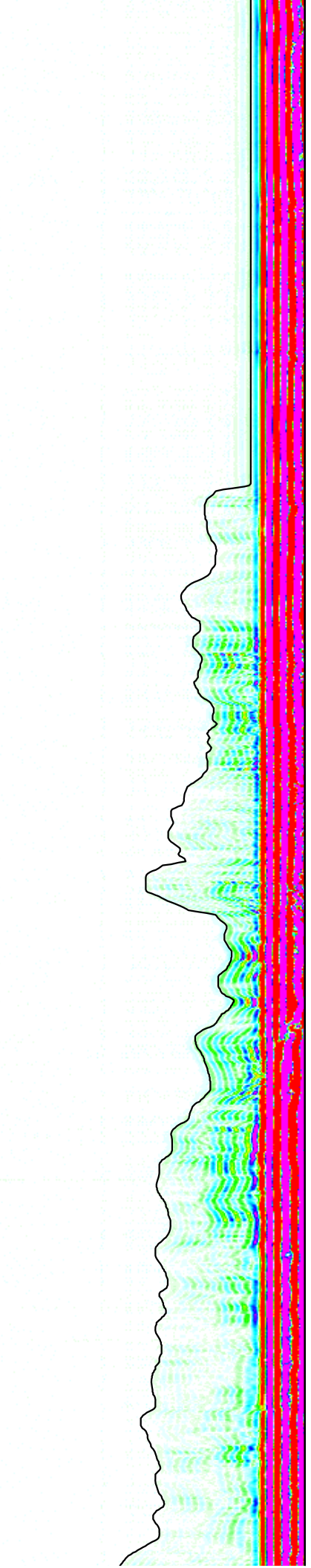
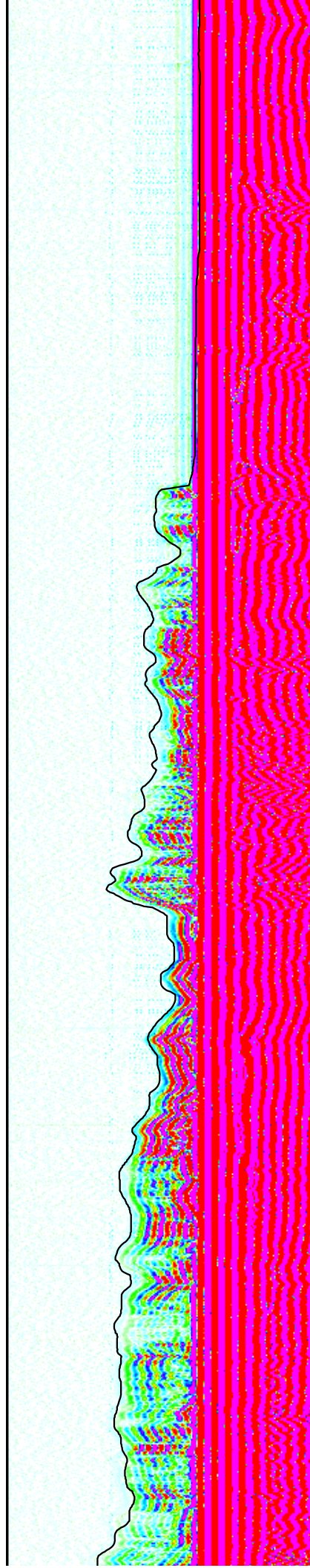
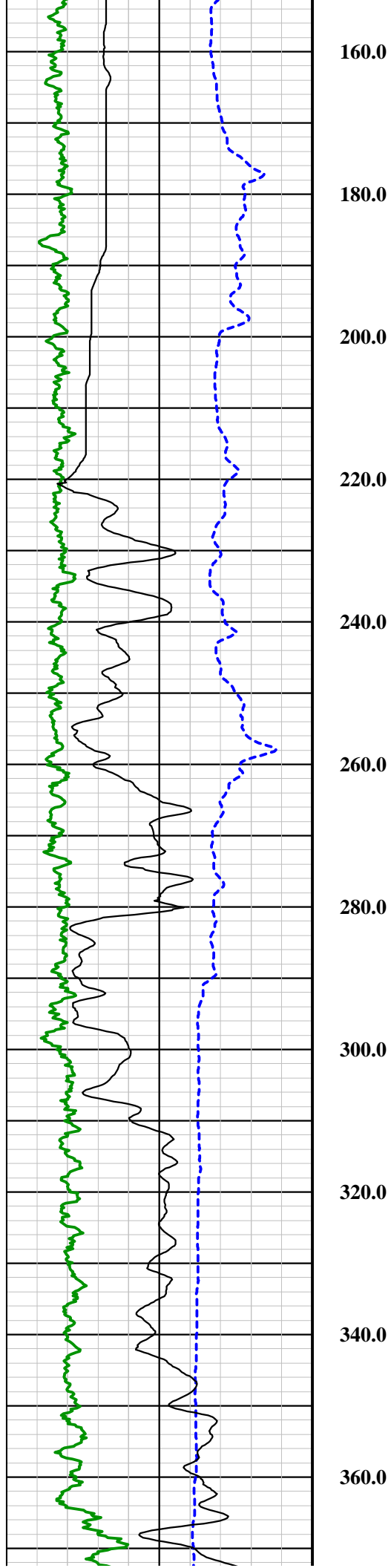
borehole geophysics & video services

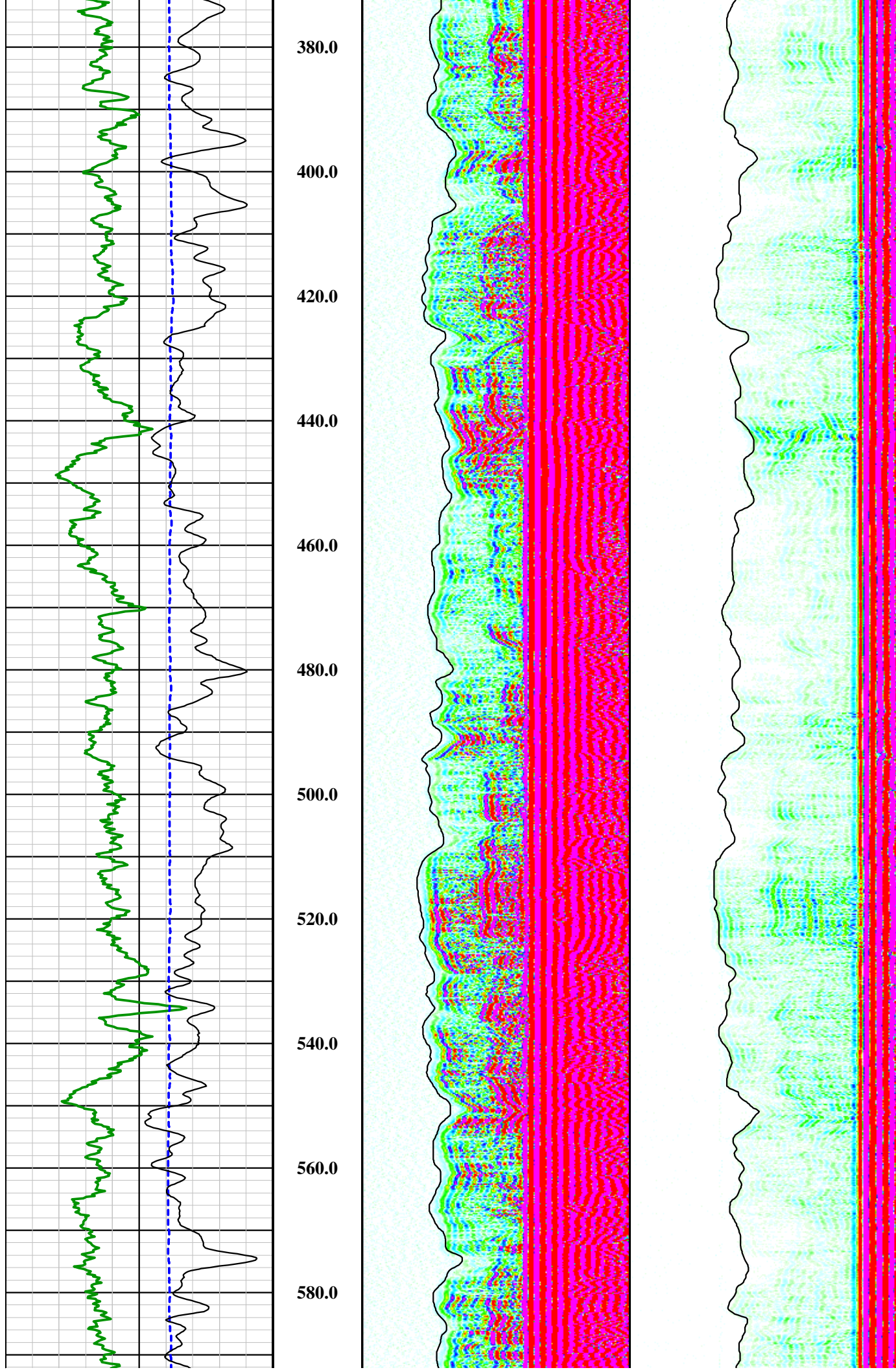
COMPANY FLORENCE COPPER		WELL ID O-07		FIELD FLORENCE COPPER		COUNTY PINAL		STATE ARIZONA	
TYPE OF LOGS: 60MM SONIC		MORE: GAMMA-CALIPER		LOCATION		OTHER SERVICES		E-LOGS DEVIATION TEMPERATURE FLUID REACTIVITY	
PERMANENT DATUM		SEC		TWP		RGE		ELEVATION	
LOG MEAS. FROM		GROUND LEVEL		ABOVE PERM. DATUM		D.F.		G.L.	
DRILLING MEAS. FROM		GROUND LEVEL		DATE		5-18-17		TYPE FLUID IN HOLE	
RUN No		1/3		MUD WEIGHT		N/A		MUD	
TYPE LOG		SONIC-GAMMA-CALIPER		VISCOSITY		N/A		FULL	
DEPTH-DRILLER		1210 FT.		LEVEL		MAX. REC. TEMP.		30.87 DEG. C	
DEPTH-LOGGER		1202 FT.		IMAGE ORIENTED TO:		N/A		0.2 FT	
BTM LOGGED INTERVAL		1202 FT.		SAMPLE INTERVAL		LOGGING TRUCK		TRUCK #900	
TOP LOGGED INTERVAL		SURFACE		LOGGING TRUCK		MSI 60MM SONIC SN 6003		MSI 60MM SONIC SN 6003	
DRILLER / RIG#		NATIONAL		LOG TIME:ON SITE/OFF SITE		0730		1630	
RECORDED BY / Logging Eng.		D. ECKMAN		LOG TIME:ON SITE/OFF SITE		0730		1630	
WITNESSED BY		CHAD - H & A		LOG TIME:ON SITE/OFF SITE		0730		1630	
RUN		BOREHOLE RECORD		CASING RECORD		TO		TO	
NO.		BIT		FROM		TO		TO	
1		SURFACE		40 FT.		STEEL		40 FT.	
2		12 1/4 IN.		40 FT.		TOTAL DEPTH			
3									
COMMENTS:									

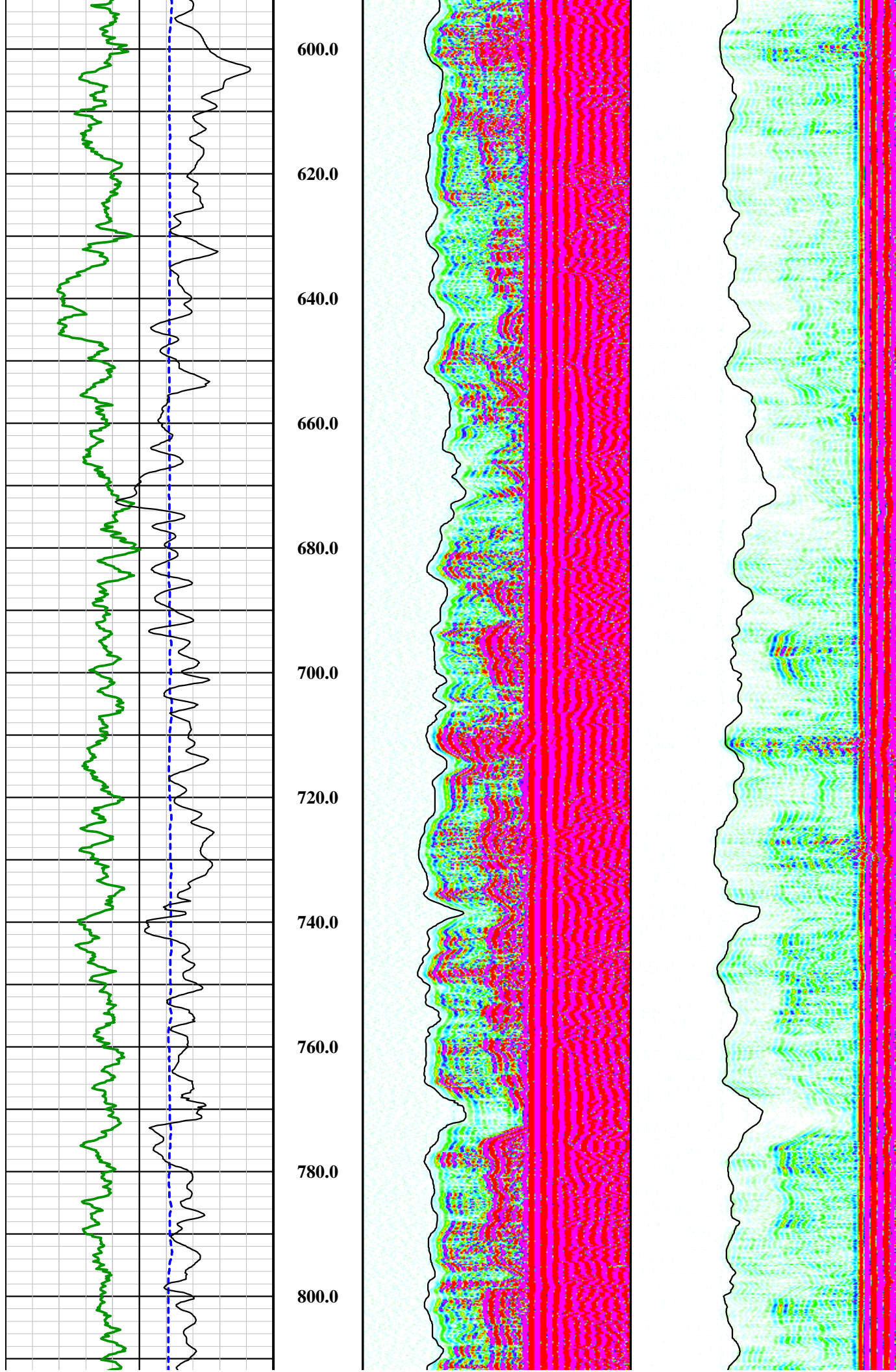
**Disclaimer:**

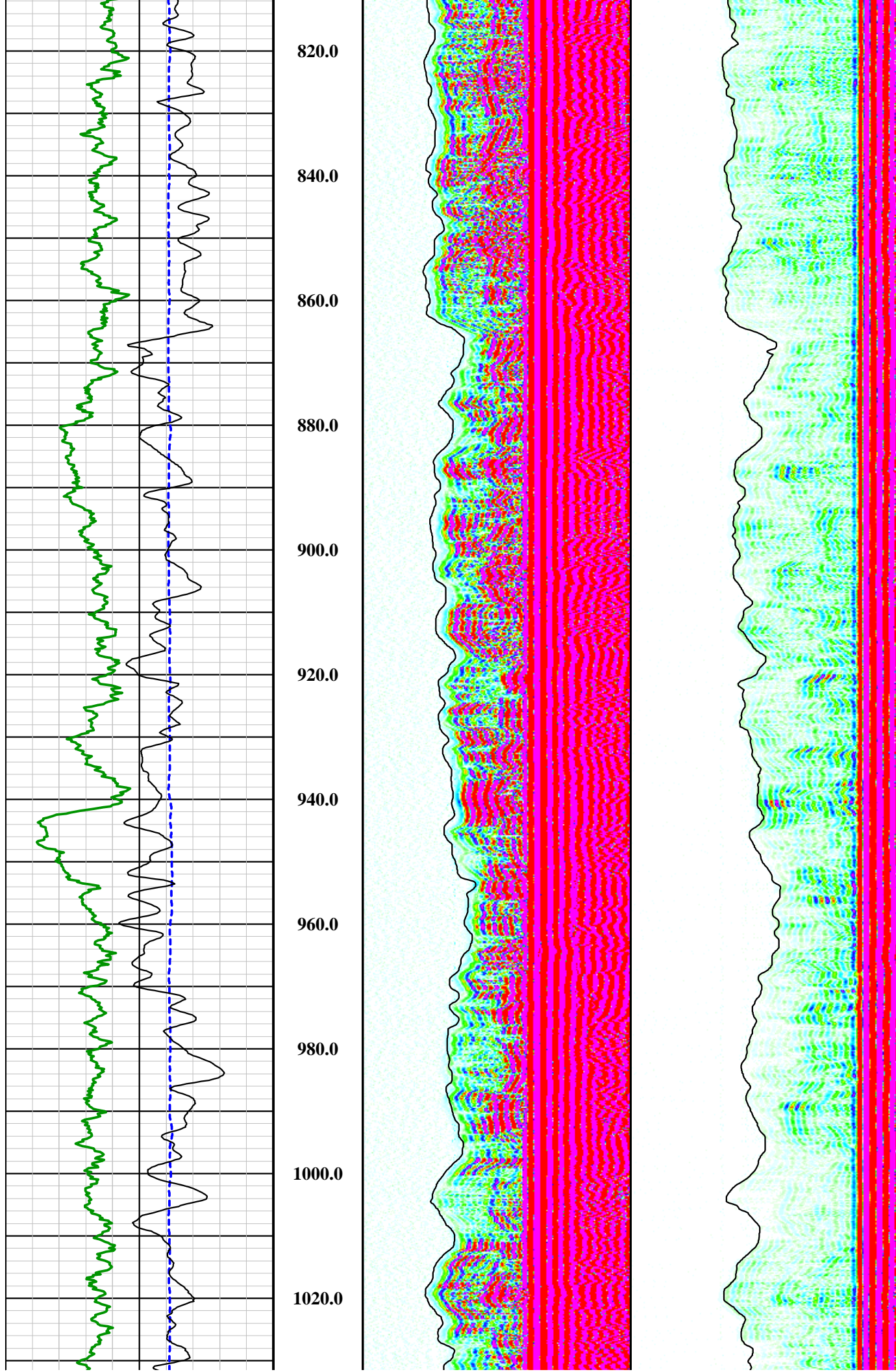
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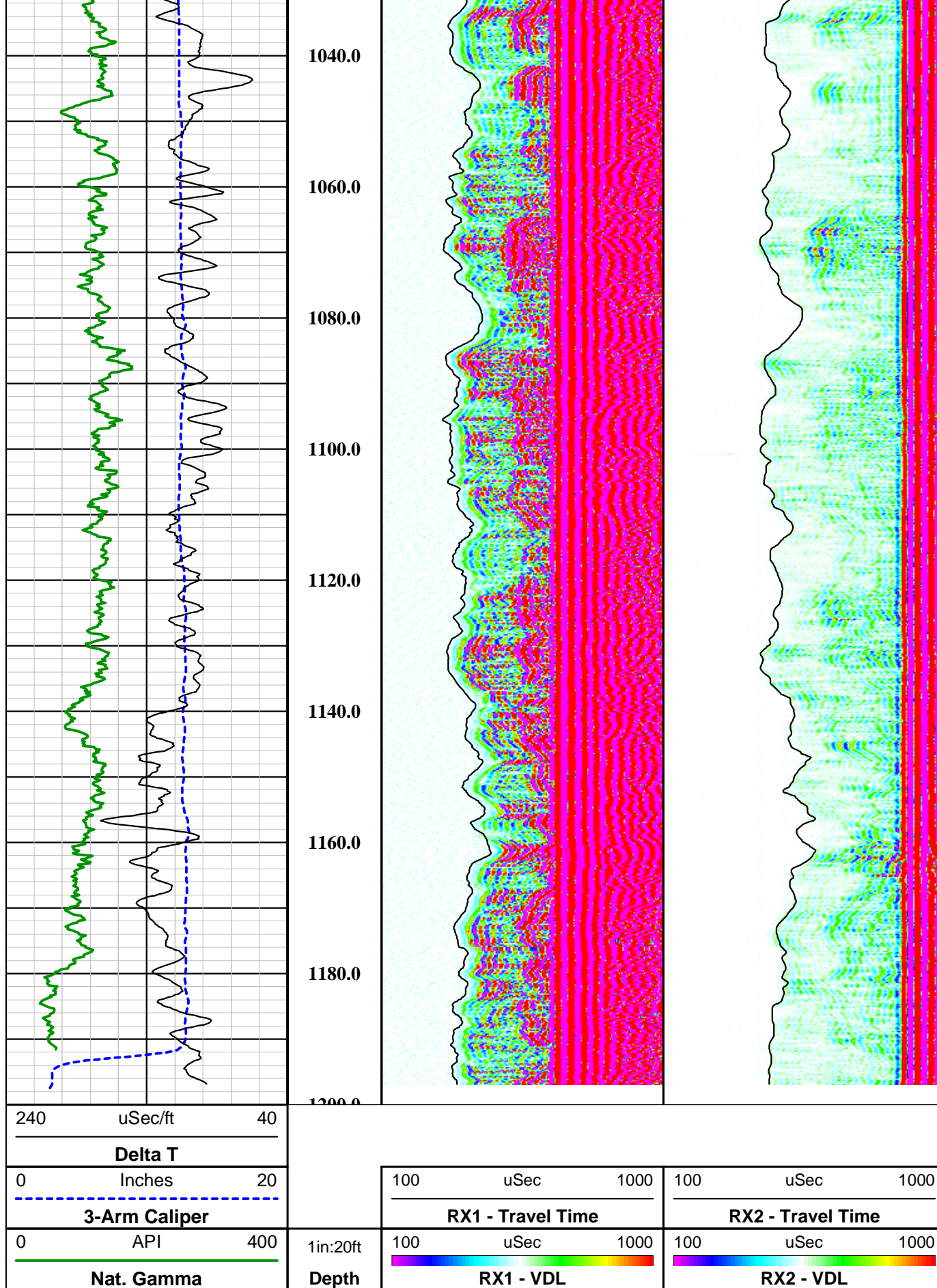












## MSI 60 mm 2 RX Full Waveform Sonic Tool

Probe Top = Depth Ref.

Tool SN: 5001, 5050 & 6003



**Four Conductor MSI Probe Top**

Probe Length = 2.8 m or 9.19 ft

Probe Weight = ~26.5 kg or 58.4 lbs

Sensors: Ceramic Piezoelectric

Transmitter Frequency: 24 - 28 kHz resonant frequency

Rx - Rx Spacing: 0.3 m (12.0 in)

Typically centralized with external centralizers

Can only be collected in fluid

Temperature Rating: 80 Deg C (176 Deg F)

Pressure Rating: 200 bar (2900 psi)

**Rx-2 Tx - Rx2 Spacing = 1.22 m (48.0 in)**

**Rx-1 Tx - Rx1 Spacing = .91 m (36.0 in)**

**Acoustic Isolater**

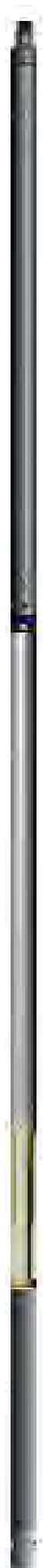
**Tx = Acoustic Transmitter**

0.660 m or 26.0 in. - End of tool to center of Tx

2.36 in or 60 mm Diameter

# MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

\*NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized\*

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



**Southwest Exploration  
Services, LLC**

borehole geophysics & video services

Company FLORENCE COPPER

Well O-07

Field FLORENCE COPPER

County PINAL

State ARIZONA

**Final**

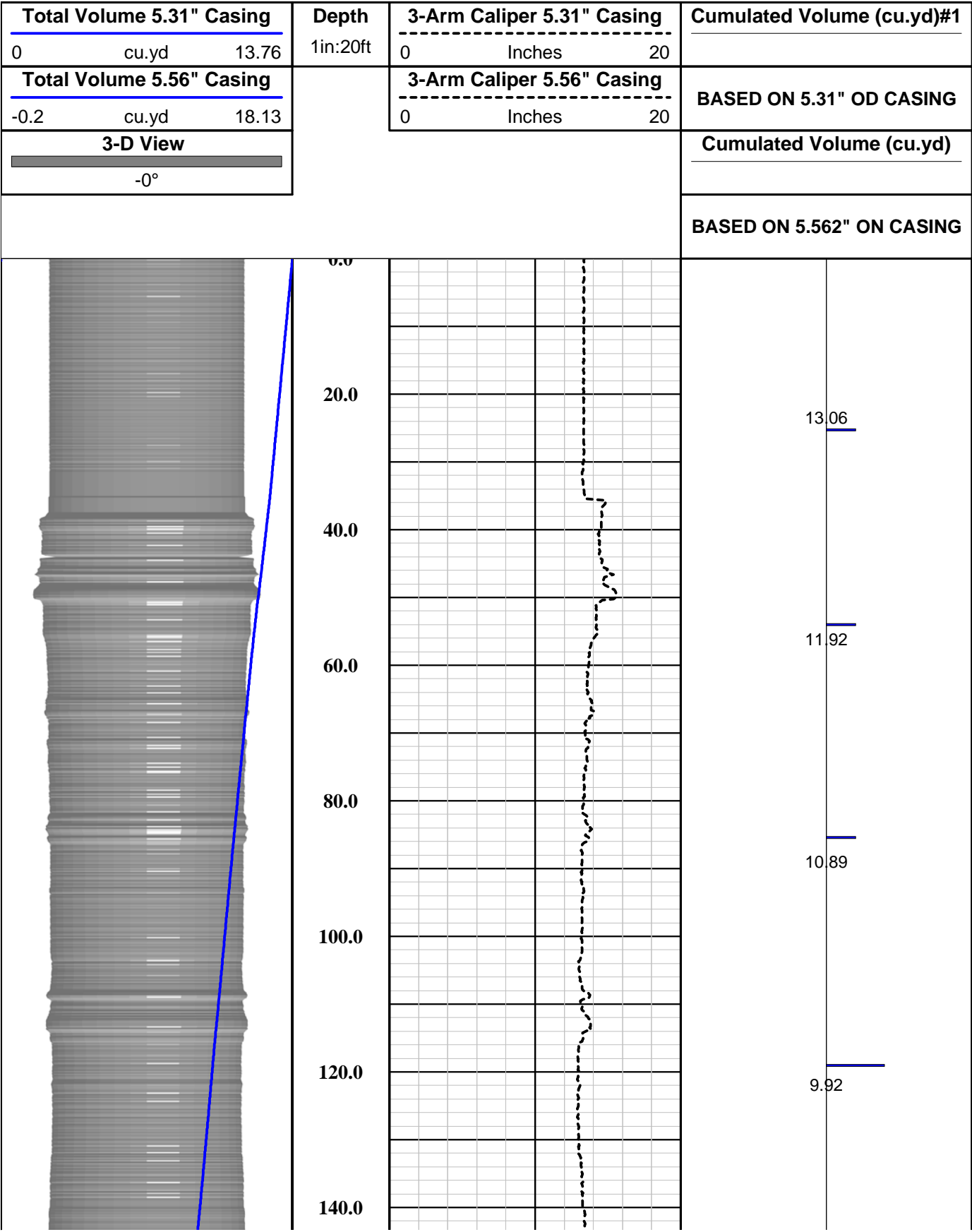
**Sonic Summary**

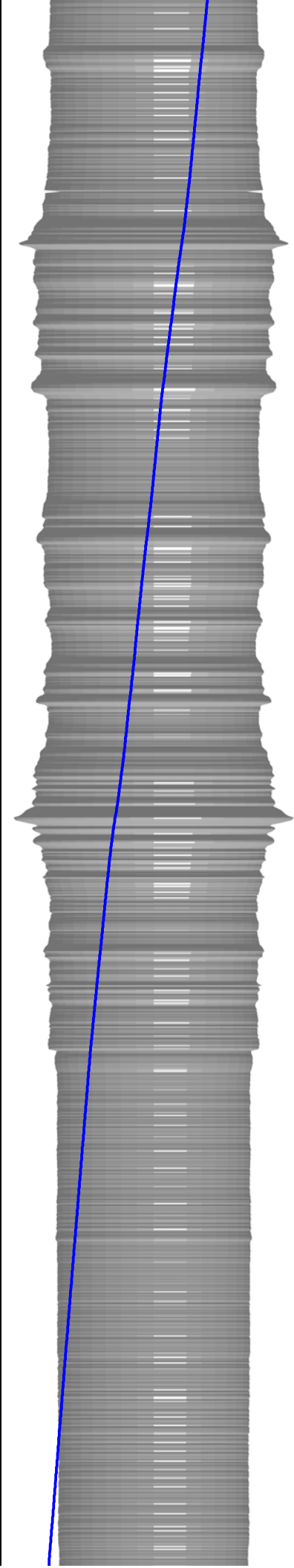


Tool Summary:					
Date	5-18-17	Date	5-18-17	Date	5-18-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	COMBO TOOL	Tool Model	ALT E-LOG IP	Tool Model	MSI 60MM SONIC
Tool SN	4183	Tool SN	5019	Tool SN	6003
From	SURFACE	From	SURFACE	From	SURFACE
To	1202 FT.	To	1202 FT.	To	1204 FT.
Recorded By	D. ECKMAN	Recorded By	D. ECKMAN	Recorded By	D. ECKMAN
Truck No	900	Truck No	900	Truck No	900
Operation Check	5-17-17	Operation Check	5-18-17	Operation Check	5-18-17
Calibration Check	5-17-17	Calibration Check	5-18-17	Calibration Check	N/A
Time Logged	1015	Time Logged	1125	Time Logged	1200
Date	5-18-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI 2DVA-1000	Tool Model		Tool Model	
Tool SN	3082	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1200 FT	To		To	
Recorded By	D. ECKMAN	Recorded By		Recorded By	
Truck No	900	Truck No		Truck No	
Operation Check	5-18-17	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	1340	Time Logged		Time Logged	
Additional Comments:					
Caliper Arms Used: 15 IN. Calibration Points: 6 IN. & 24 IN.					

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160.0

180.0

200.0

220.0

240.0

260.0

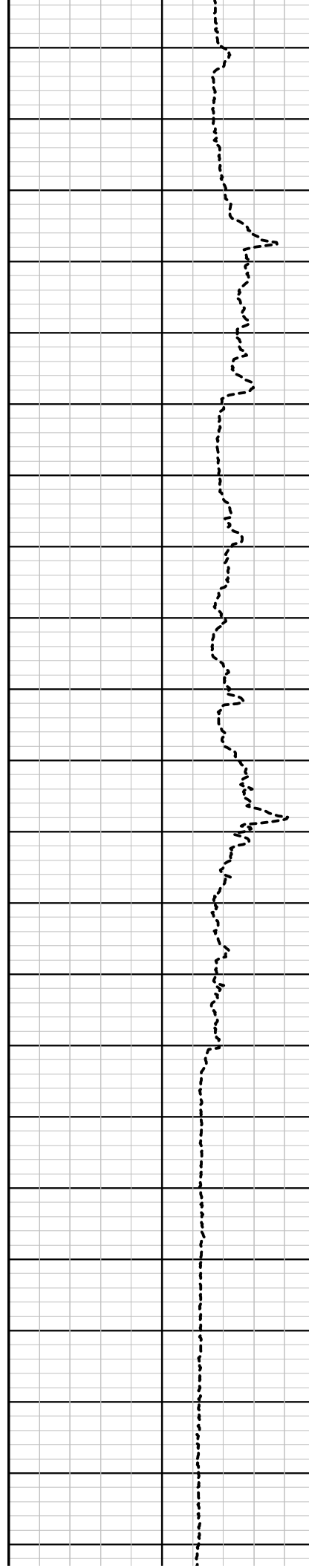
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300.0

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340.0

360.0



8.93

7.73

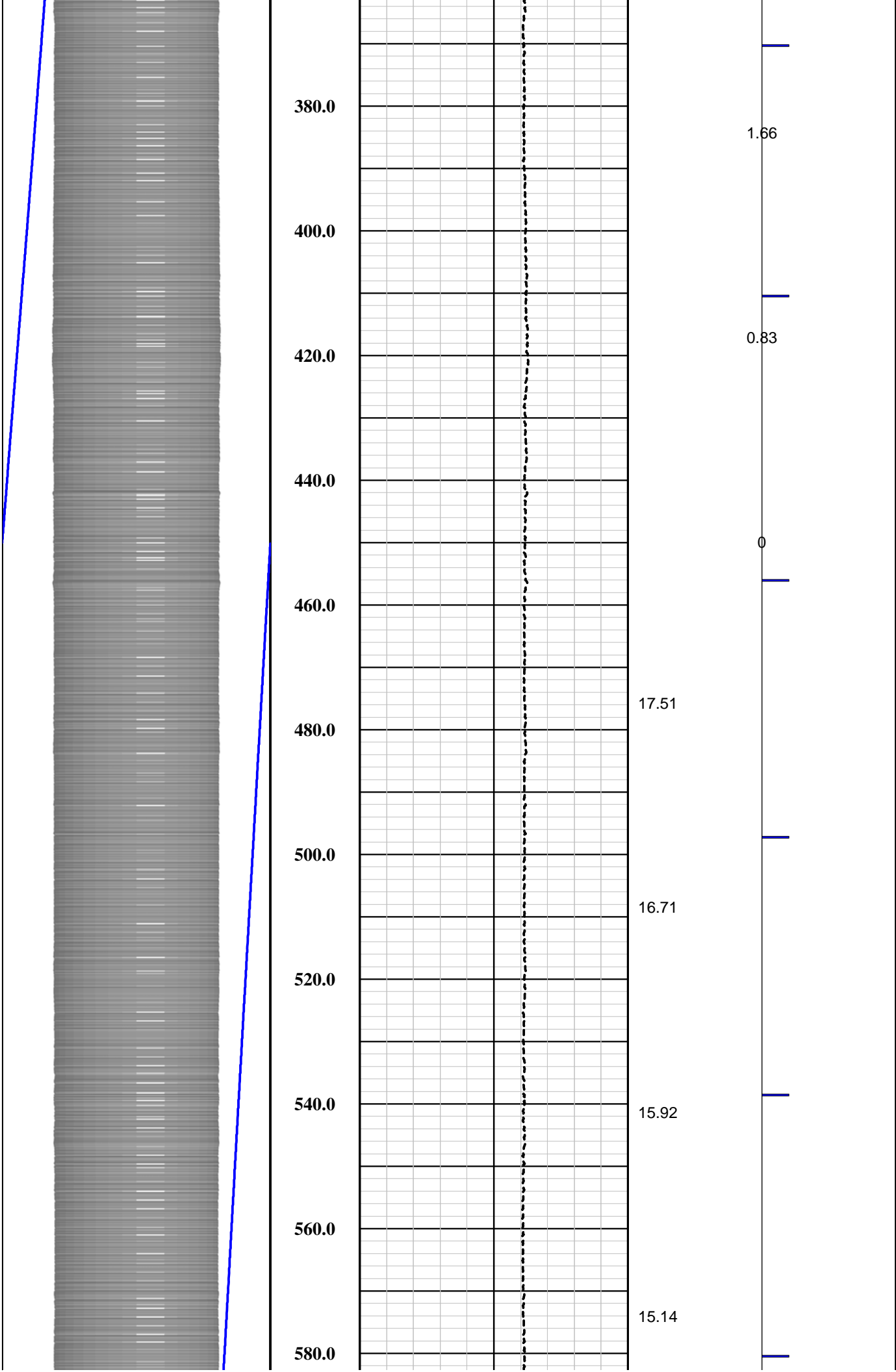
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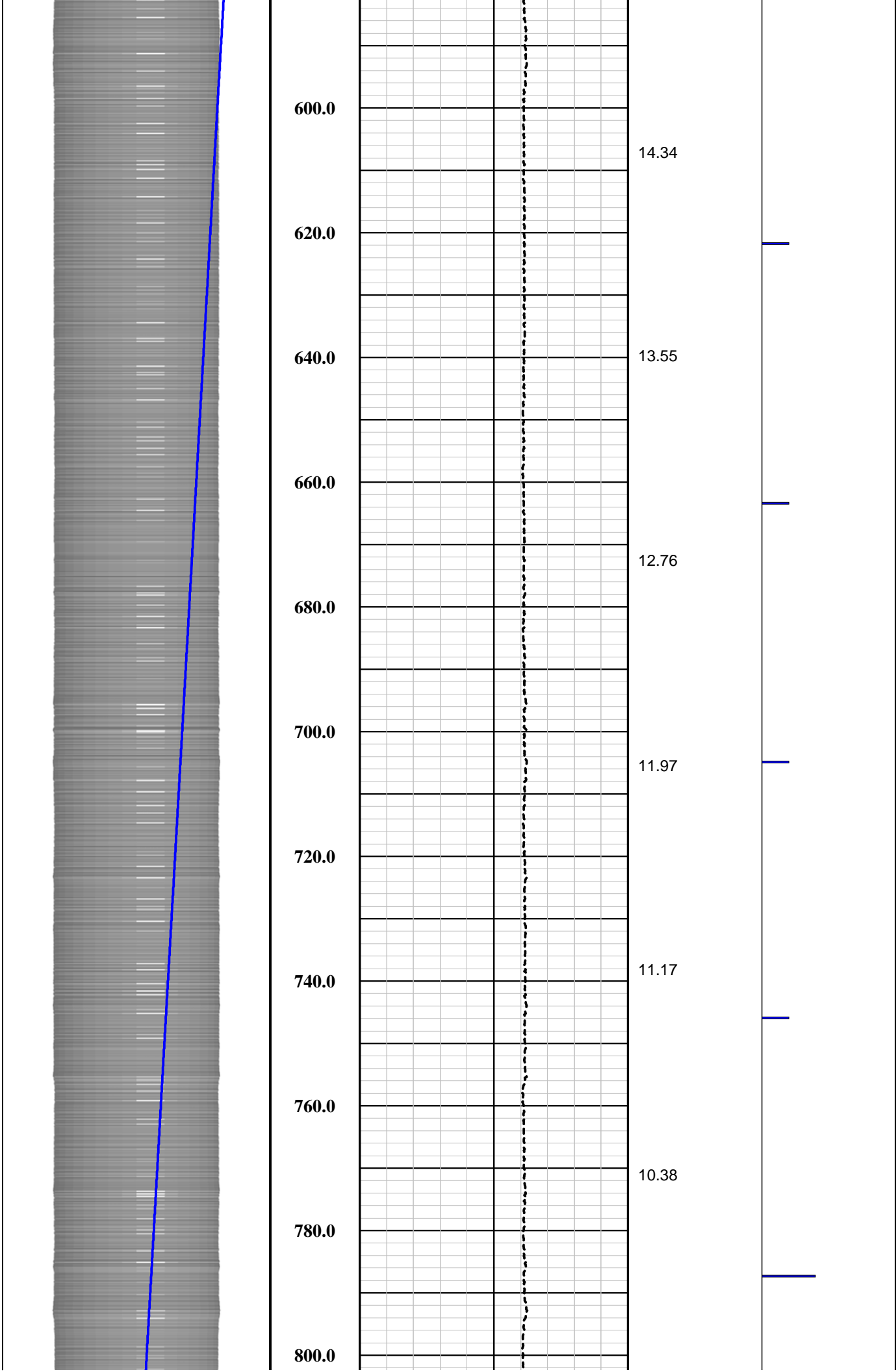
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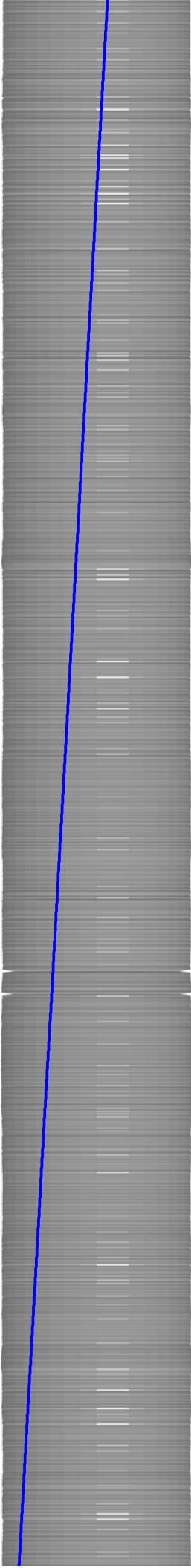
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3.31

2.47







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880.0

900.0

920.0

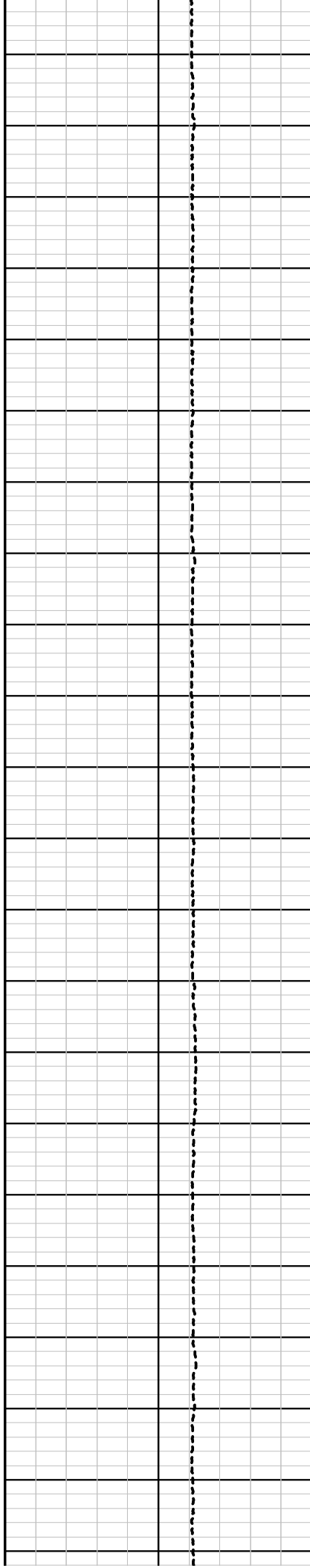
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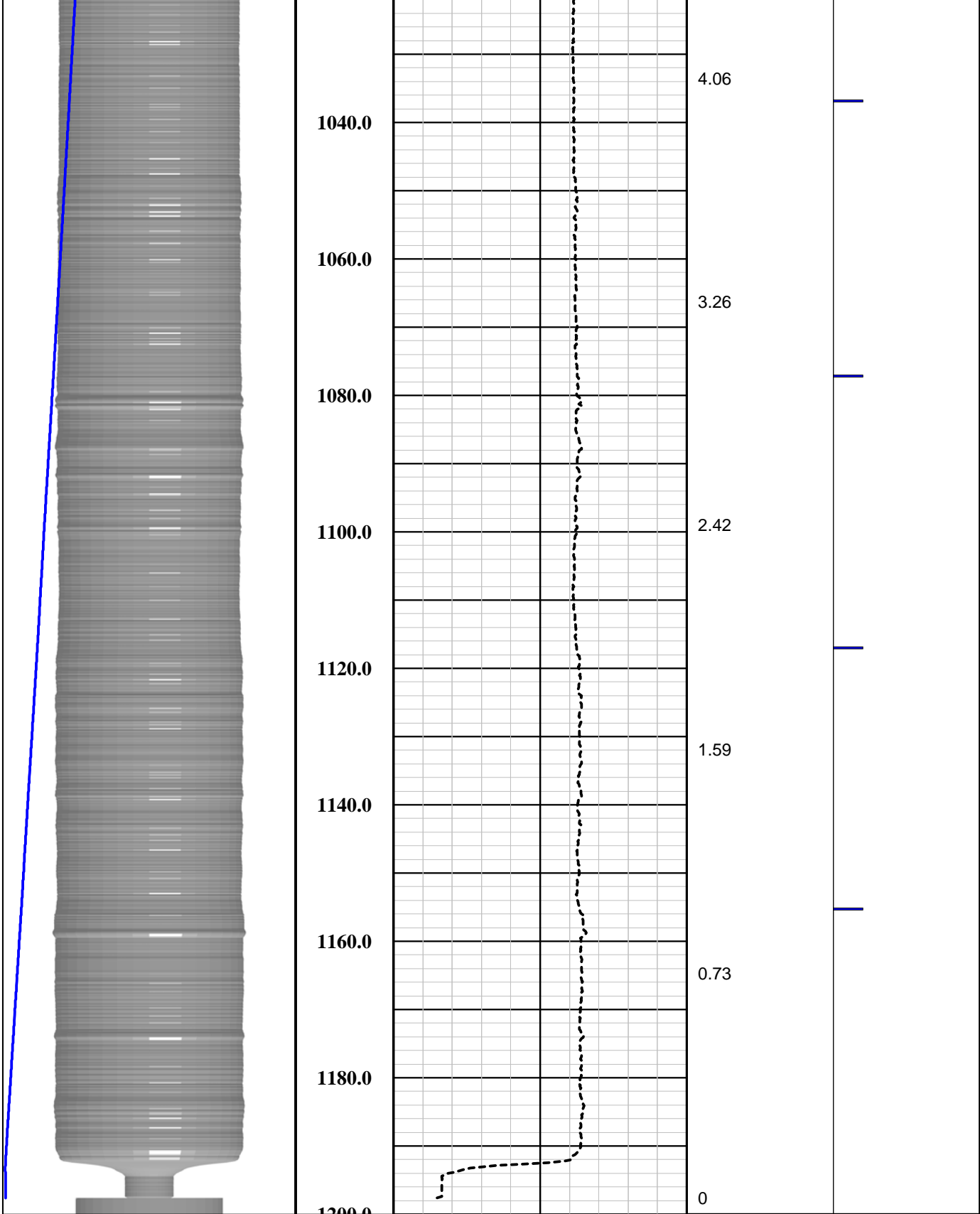
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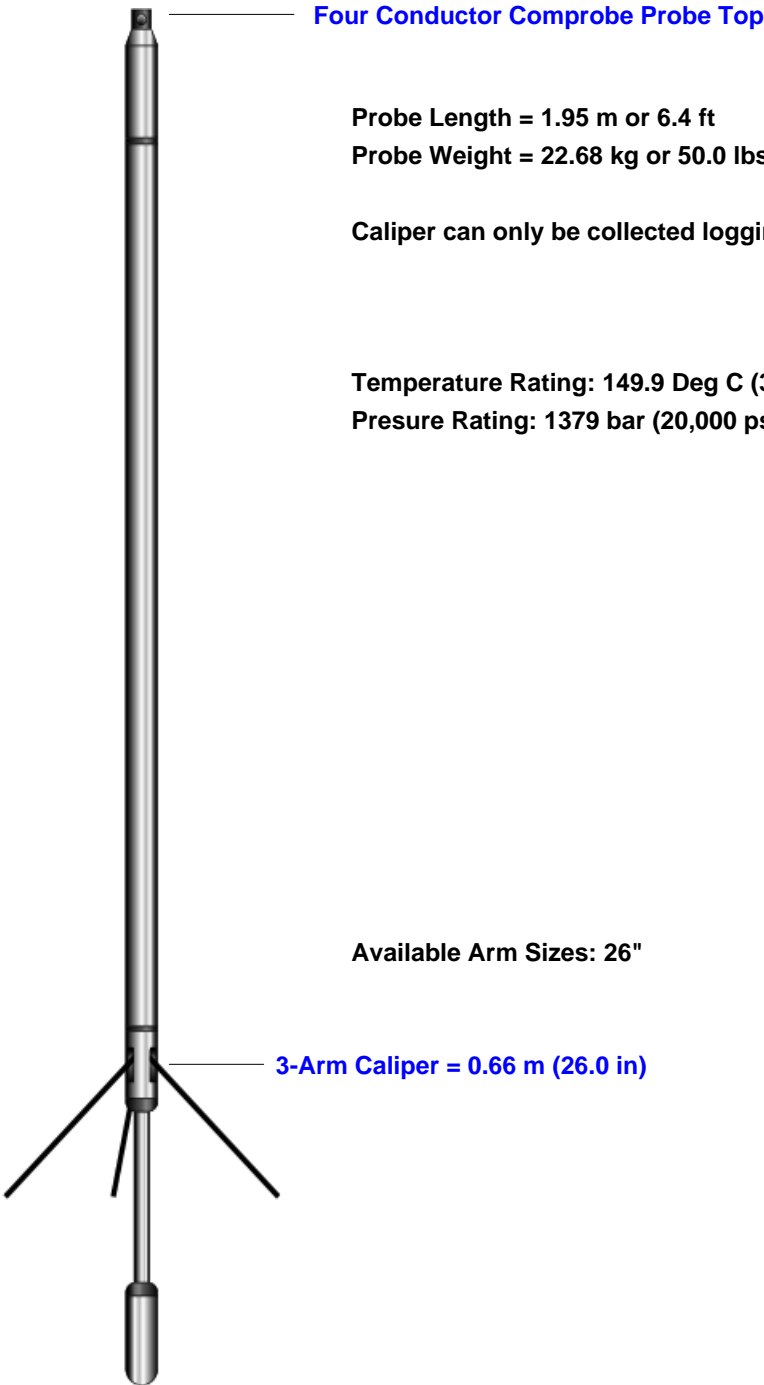




				BASED ON 5.562" ON CASING	
<div><div>-0°</div><div>3-D View</div><div>-0.2      cu.yd      18.13</div><div>Total Volume 5.56" Casing</div><div>0      cu.yd      13.76</div><div>Total Volume 5.31" Casing</div></div>				Cumulated Volume (cu.yd)	
				BASED ON 5.31" OD CASING	
<div>1in:20ft</div> <div>Depth</div>				Cumulated Volume (cu.yd)#1	

# Comprobe 2 1/8" 3-Arm Caliper SN 6555

Probe Top = Depth Ref.



Probe Length = 1.95 m or 6.4 ft  
Probe Weight = 22.68 kg or 50.0 lbs

Caliper can only be collected logging up hole.

Temperature Rating: 149.9 Deg C (300 Deg F)  
Presure Rating: 1379 bar (20,000 psi)

Available Arm Sizes: 26"

2.125" or 53.975 mm Diameter



**Southwest Exploration Services, LLC**  
borehole geophysics & video services

Company	FLORENCE COPPER
Well	O-07
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA



# *Drift Report*

## Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR  
**FLORENCE COPPER and FLORENCE COPPER**

**O-07**

Thursday - May 18, 2017



This Wellbore Interpretation Package represents our best efforts to provide a correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical or other types of measurements, we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by Customer resulting from any interpretation made by this document. We do not warrant or guarantee the accuracy of the data, specifically including (but without limitations) the accuracy of data transmitted by electronic process, and we will not be responsible for accidental or intentional interception of such data by third parties. Our employees are not empowered to change or otherwise modify the attached interpretation. Furthermore, along with Eagle Pro Software we do not warrant or guarantee the accuracy of the programming techniques employed to produce this document. By accepting this Interpretation Package, the Customer agrees to the foregoing, and to our General Terms and Conditions.

**Southwest Exploration Services, LLC**  
(480) 926-4558

# WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company:	FLORENCE COPPER			Well Owner:	FLORENCE COPPER					
County:	PINAL	State:	Arizona	Country:	USA					
Well Number:	O-07	Survey Date:	Thursday - May 18, 2017	Magnetic Declination:	Declination Correction Not Used					
Field:	FLORENCE COPPER		Drift Calculation Methodology:	Balanced Tangential Method						
Location:										
Remarks:										
Witness:	CHAD - H & A	Vehicle No.:	900	Invoice No.:	Operator:	D. ECKMAN	Well Depth:	1200 Feet	Casing size:	12.25 Inches
Tool:	Compass - 6002		Lat.:	Long.:	Sec.:	Twp.:	Rge.:			

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
20	0.27	034.43	20.00						
40	0.14	302.01	39.99	0.052	0.006	0.42	14.35	0.05' (.60")	006.50
60	0.43	306.87	59.98	0.110	-0.075	0.96	0.84	0.13' (1.56")	325.80
80	0.42	319.99	79.97	0.211	-0.182	0.84	2.27	0.28' (3.36")	319.20
100	0.27	294.14	99.97	0.286	-0.272	0.42	4.45	0.40' (4.80")	316.50
120	0.16	241.92	119.96	0.292	-0.340	0.14	8.75	0.45' (5.40")	310.70
140	0.16	291.96	139.95	0.289	-0.391	0.43	8.41	0.49' (5.88")	306.50
160	0.18	283.19	159.94	0.307	-0.447	0.83	1.52	0.54' (6.48")	304.40
180	0.24	161.05	179.93	0.275	-0.464	0.95	17.40	0.54' (6.48")	300.60
200	0.46	077.19	199.92	0.253	-0.372	0.38	13.28	0.45' (5.40")	304.20
220	0.39	034.97	219.91	0.327	-0.255	1.00	7.16	0.41' (4.92")	322.00
240	0.57	355.88	239.90	0.482	-0.223	1.00	6.65	0.53' (6.36")	335.20
260	0.37	309.97	259.89	0.623	-0.280	0.35	7.75	0.68' (8.16")	335.80
280	0.16	339.59	279.88	0.691	-0.339	0.93	5.08	0.77' (9.24")	333.80
300	0.22	007.89	299.87	0.755	-0.343	0.79	4.86	0.83' (9.96")	335.50
320	0.62	067.84	319.86	0.834	-0.238	0.51	9.93	0.87' (10.44")	344.10
340	0.59	358.48	339.85	0.978	-0.141	0.01	11.31	0.99' (11.88")	351.80
360	0.34	307.00	359.84	1.117	-0.191	0.54	8.63	1.13' (13.56")	350.30

Page No. 1

True Vertical Depth: 1199.42'

Final Drift Distance: 10.70' (128.40")

Final Drift Bearing: 93.30°

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

(480) 926-4558

MEASURED DATA			DATA COMPUTATIONS										
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees				
380	0.24°	342.91°	379.83	1.193	-0.251	0.74	6.13	1.22' (14.64")	348.10				
400	0.15°	016.28°	399.82	1.258	-0.256	0.89	5.71	1.28' (15.36")	348.50				
420	0.36°	158.17°	419.81	1.225	-0.225	0.22	18.79	1.25' (15.00")	349.60				
440	0.63°	077.57°	439.80	1.190	-0.094	0.97	12.86	1.19' (14.28")	355.50				
460	0.62°	001.07°	459.79	1.322	0.015	0.97	12.31	1.32' (15.84")	000.70				
480	0.20°	016.40°	479.78	1.464	0.027	0.15	2.65	1.46' (17.52")	001.10				
500	0.64°	111.06°	499.77	1.457	0.141	0.83	14.62	1.46' (17.52")	005.50				
520	0.84°	033.73°	519.76	1.539	0.327	0.61	12.42	1.57' (18.84")	012.00				
540	0.35°	015.25°	539.75	1.720	0.424	0.71	3.19	1.77' (21.24")	013.90				
560	0.11°	050.12°	559.74	1.791	0.455	0.25	5.96	1.85' (22.20")	014.20				
580	0.52°	160.96°	579.73	1.718	0.499	0.76	16.37	1.79' (21.48")	016.20				
600	0.82°	107.31°	599.72	1.590	0.665	0.51	8.97	1.72' (20.64")	022.70				
620	0.72°	063.64°	619.71	1.603	0.914	0.71	7.39	1.85' (22.20")	029.70				
640	0.44°	026.45°	639.70	1.728	1.061	0.10	6.34	2.03' (24.36")	031.60				
660	0.24°	080.92°	659.69	1.803	1.137	0.84	9.10	2.13' (25.56")	032.20				
680	0.85°	134.67°	679.68	1.705	1.284	0.82	8.99	2.13' (25.56")	037.00				
700	1.06°	069.32°	699.67	1.666	1.563	0.21	10.73	2.28' (27.36")	043.20				
720	0.55°	045.25°	719.66	1.799	1.804	0.57	4.15	2.55' (30.60")	045.10				
740	0.29°	136.62°	739.65	1.830	1.907	0.27	14.22	2.64' (31.68")	046.20				
760	1.00°	127.24°	759.64	1.688	2.081	0.93	1.63	2.68' (32.16")	051.00				
780	0.99°	069.88°	779.63	1.642	2.382	0.62	9.54	2.89' (34.68")	055.40				
800	0.95°	099.43°	799.62	1.674	2.708	0.96	5.07	3.18' (38.16")	058.30				
820	0.99°	127.95°	819.61	1.541	3.008	0.10	4.90	3.38' (40.56")	062.90				
840	1.18°	071.00°	839.60	1.502	3.339	0.33	9.48	3.66' (43.92")	065.80				
860	0.84°	090.85°	859.59	1.567	3.680	0.54	3.43	4.00' (48.00")	066.90				
880	1.18°	127.02°	879.58	1.441	3.991	0.50	6.17	4.24' (50.88")	070.10				
900	1.33°	082.72°	899.57	1.346	4.386	0.46	7.49	4.59' (55.08")	072.90				
920	0.87°	093.65°	919.56	1.366	4.768	0.66	1.89	4.96' (59.52")	074.00				
940	0.90°	099.74°	939.55	1.330	5.074	0.09	1.06	5.25' (63.00")	075.30				
960	1.06°	112.42°	959.54	1.233	5.400	0.25	2.20	5.54' (66.48")	077.10				
980	1.47°	084.55°	979.53	1.187	5.826	0.99	4.79	5.95' (71.40")	078.50				
1,000	1.05°	100.67°	999.53	1.177	6.261	0.93	2.79	6.37' (76.44")	079.40				
1,020	1.43°	131.70°	1,019.52	0.977	6.627	0.97	5.32	6.70' (80.40")	081.60				
Page No. 2			True Vertical Depth: 1199.42'							Final Drift Distance: 10.70' (128.40")		Final Drift Bearing: 93.30°	

(480) 926-4558

[illegible]

**Final Drift Bearing: 93.30°**

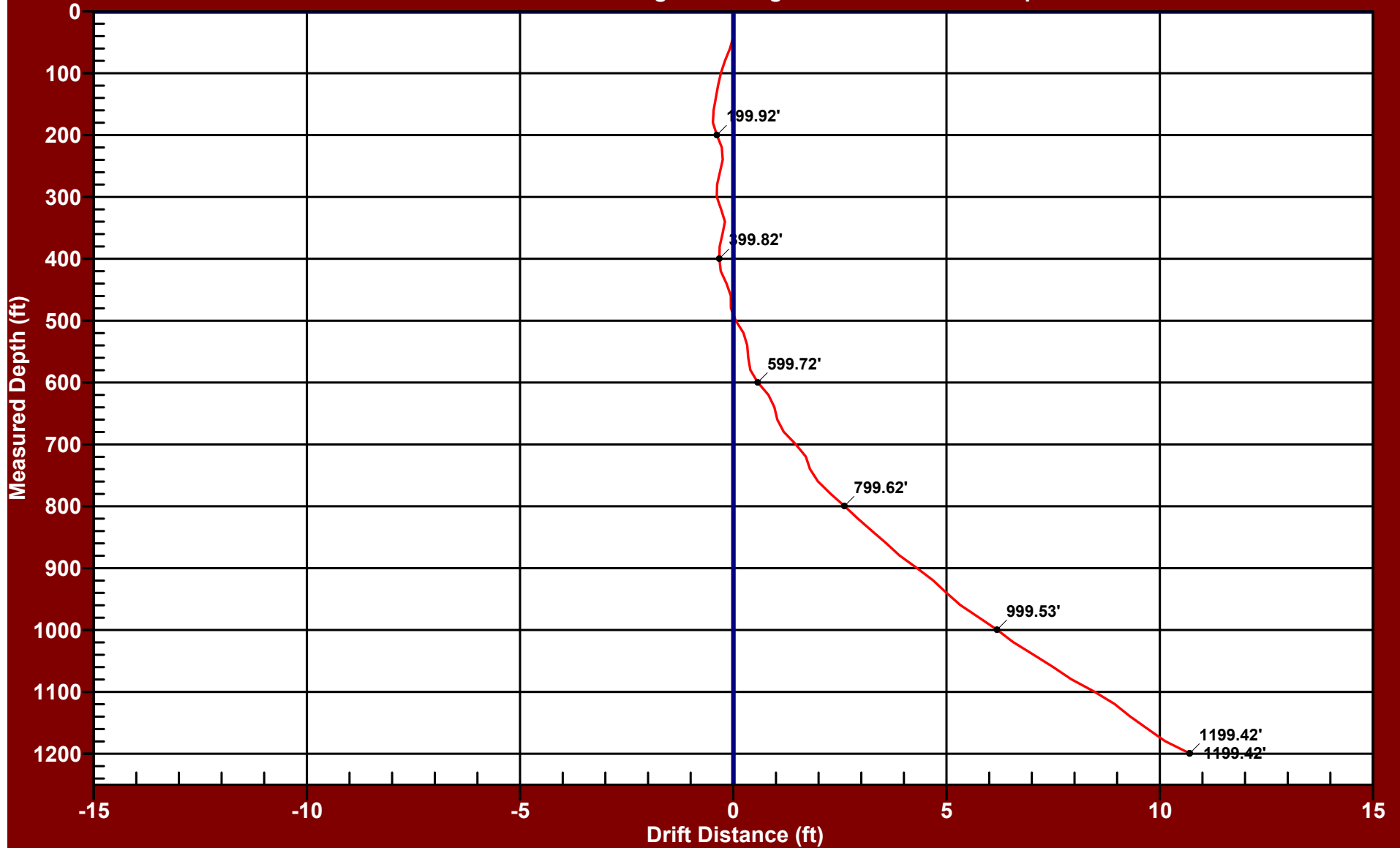
# PLANE OF DRIFT VIEW - O-07

FLORENCE COPPER  
FLORENCE COPPER

Drift Distance = 10.70 Feet

Drift Bearing = 93.3 Degrees

True Vertical Depth = 1199.42 Feet



Date of Survey: Thursday - May 18, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

# 3D PROJECTION VIEW - O-07

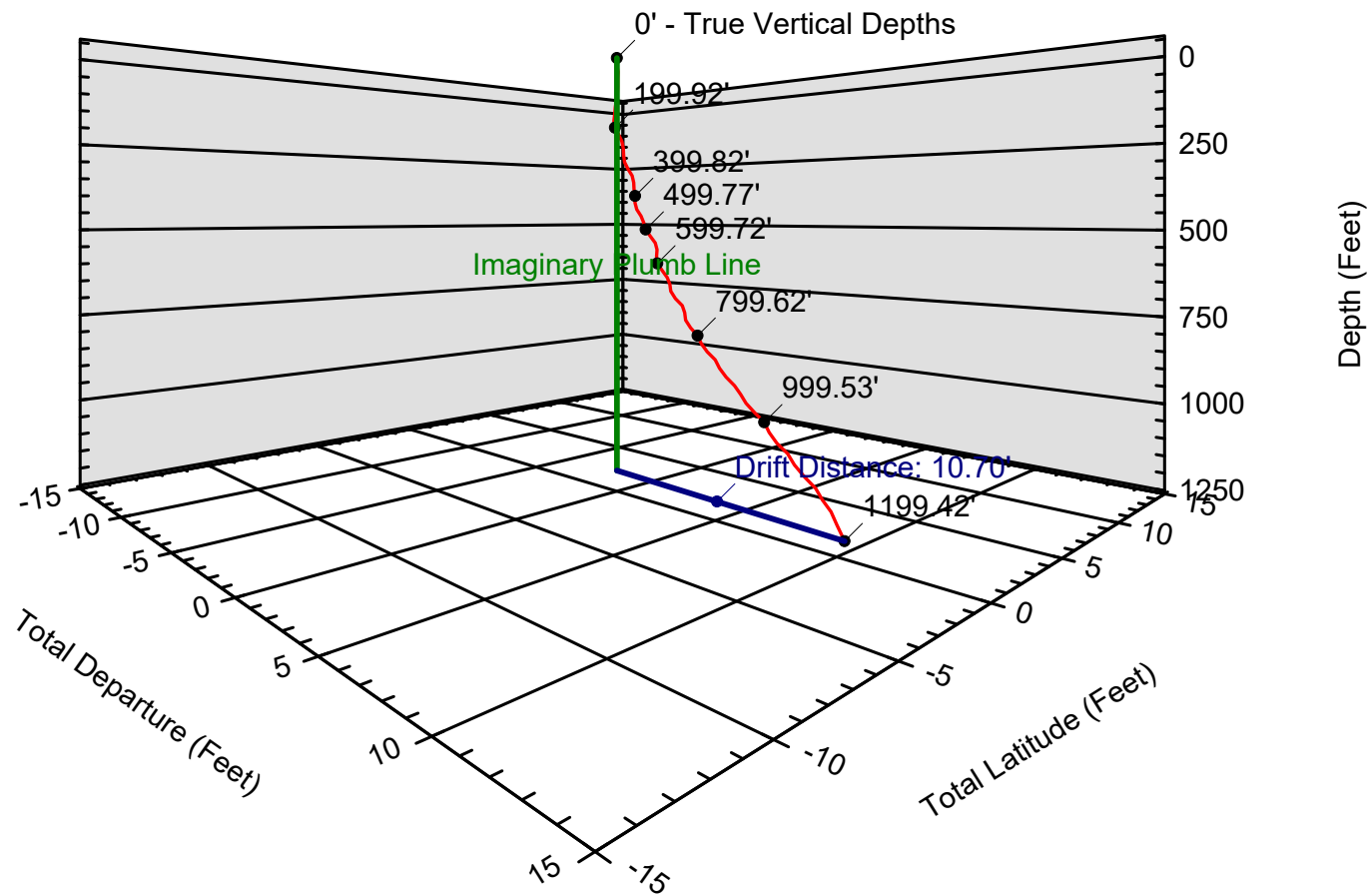
FLORENCE COPPER  
FLORENCE COPPER

Drift Distance = 10.70 Feet

Drift Bearing = 93.3 Degrees

True Vertical Depth = 1199.42 Feet

226.0



Date of Survey: Thursday - May 18, 2017

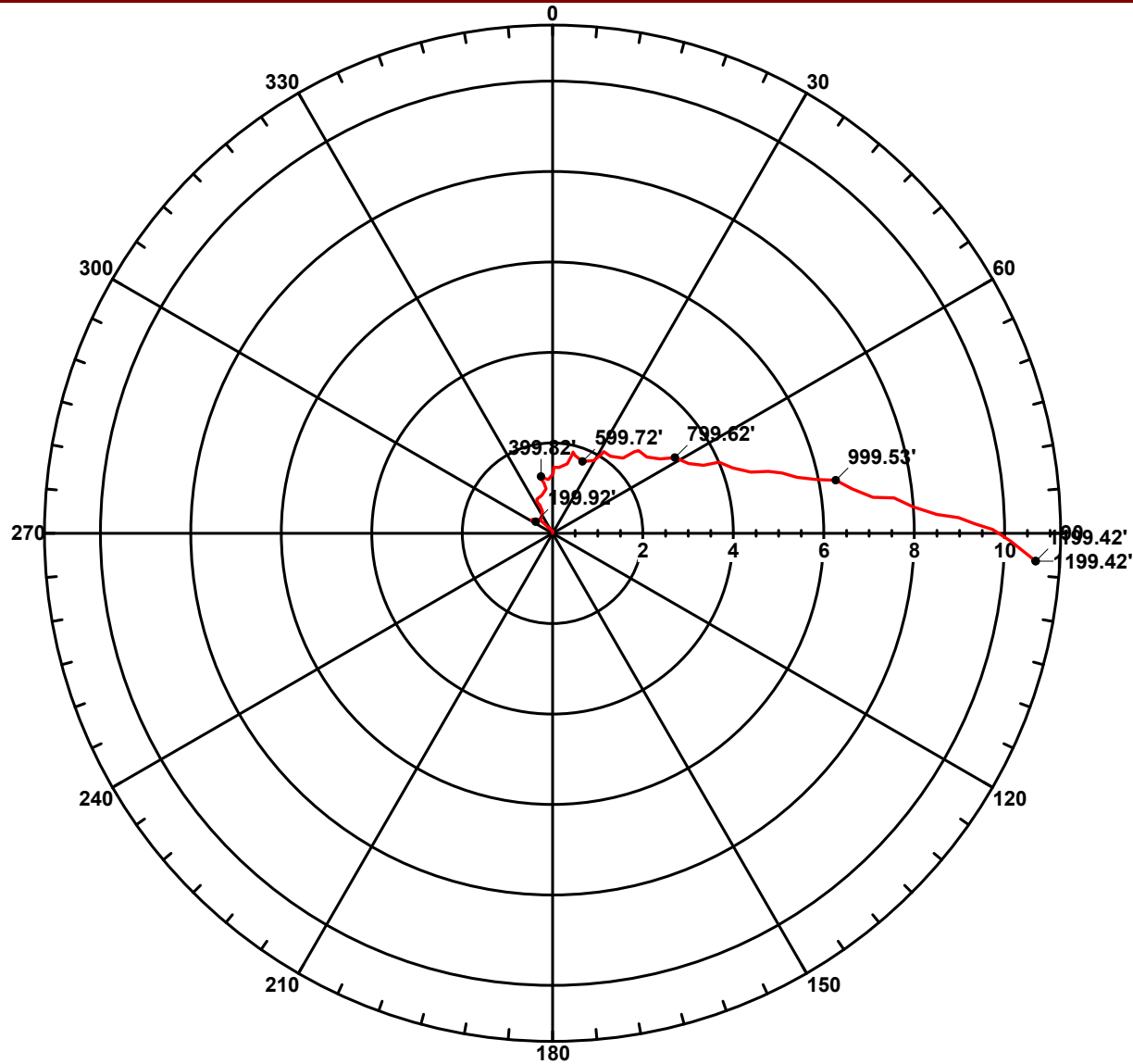
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

# POLAR VIEW - O-07

FLORENCE COPPER  
FLORENCE COPPER

Drift Distance = 10.70 Feet    Drift Bearing = 93.3 Degrees    True Vertical Depth = 1199.42 Feet



Date of Survey: Thursday - May 18, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

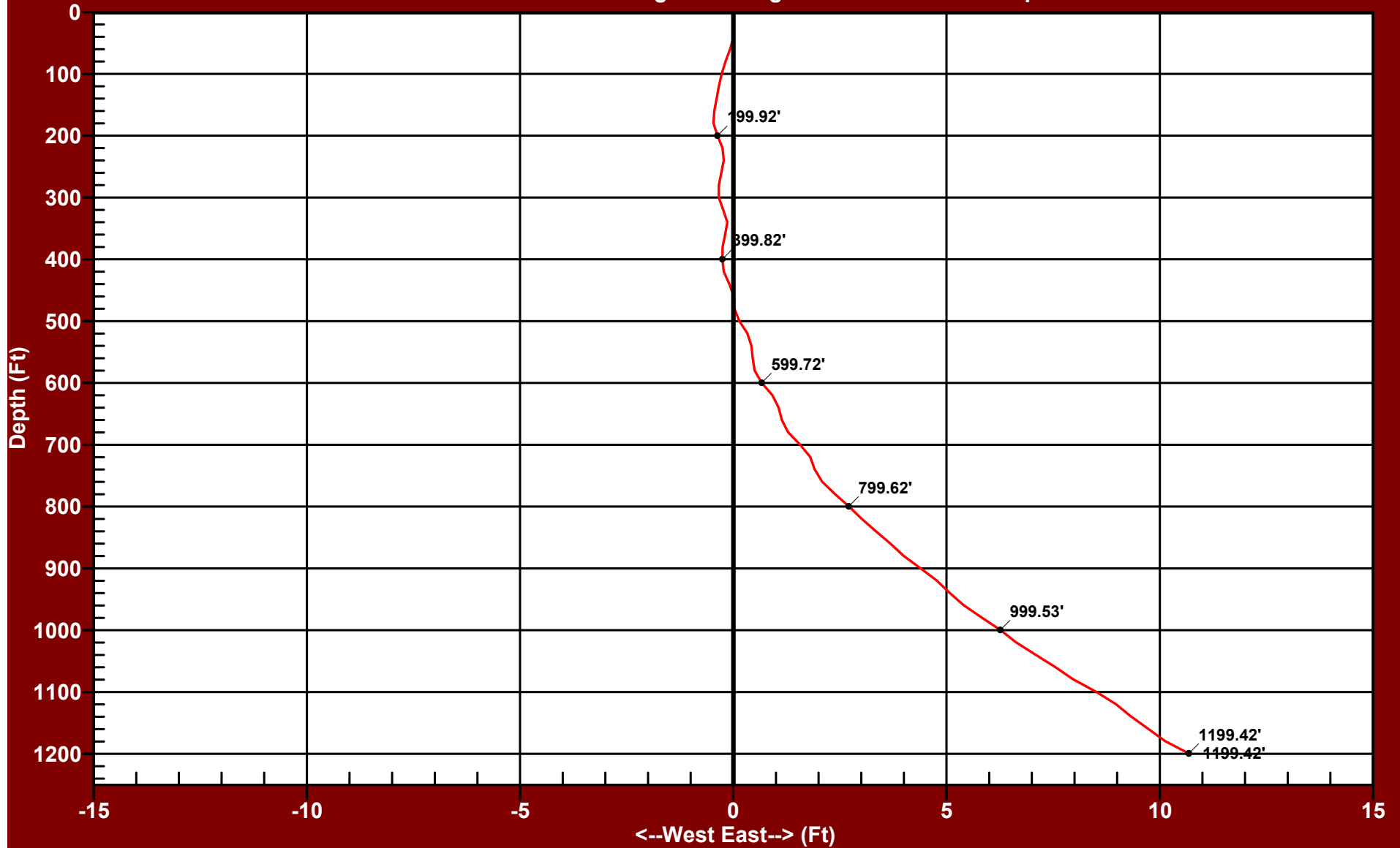
# EASTING RECTANGULAR VIEW - O-07

FLORENCE COPPER  
FLORENCE COPPER

Drift Distance = 10.70 Feet

Drift Bearing = 93.3 Degrees

True Vertical Depth = 1199.42 Feet



Date of Survey: Thursday - May 18, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

# NORTHING RECTANGULAR VIEW - O-07

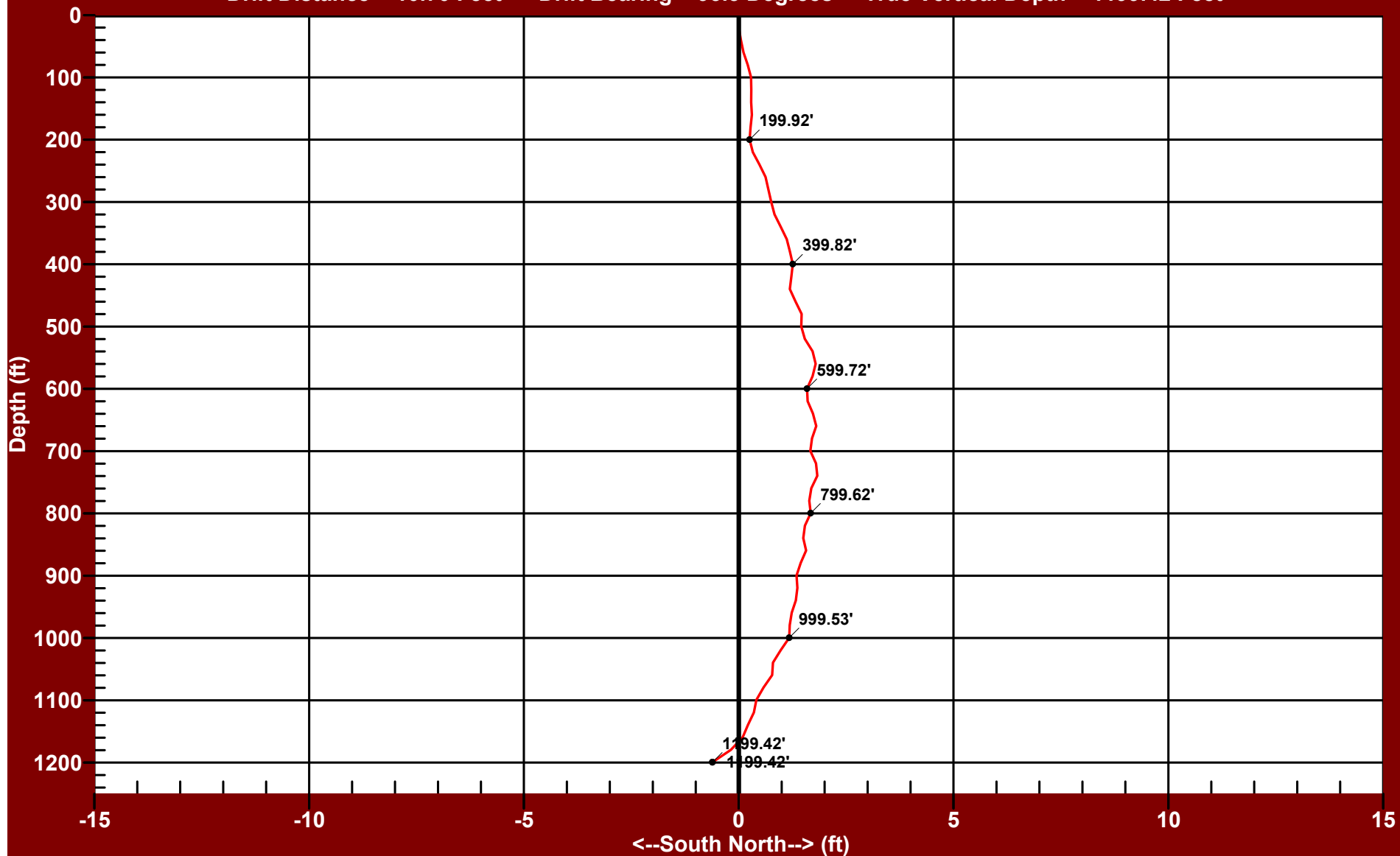
FLORENCE COPPER

FLORENCE COPPER

Drift Distance = 10.70 Feet

Drift Bearing = 93.3 Degrees

True Vertical Depth = 1199.42 Feet



Date of Survey: Thursday - May 18, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

## **APPENDIX F**

### **Cement Bond Log Summary**

WELL O-07

Geophysical Log Summary

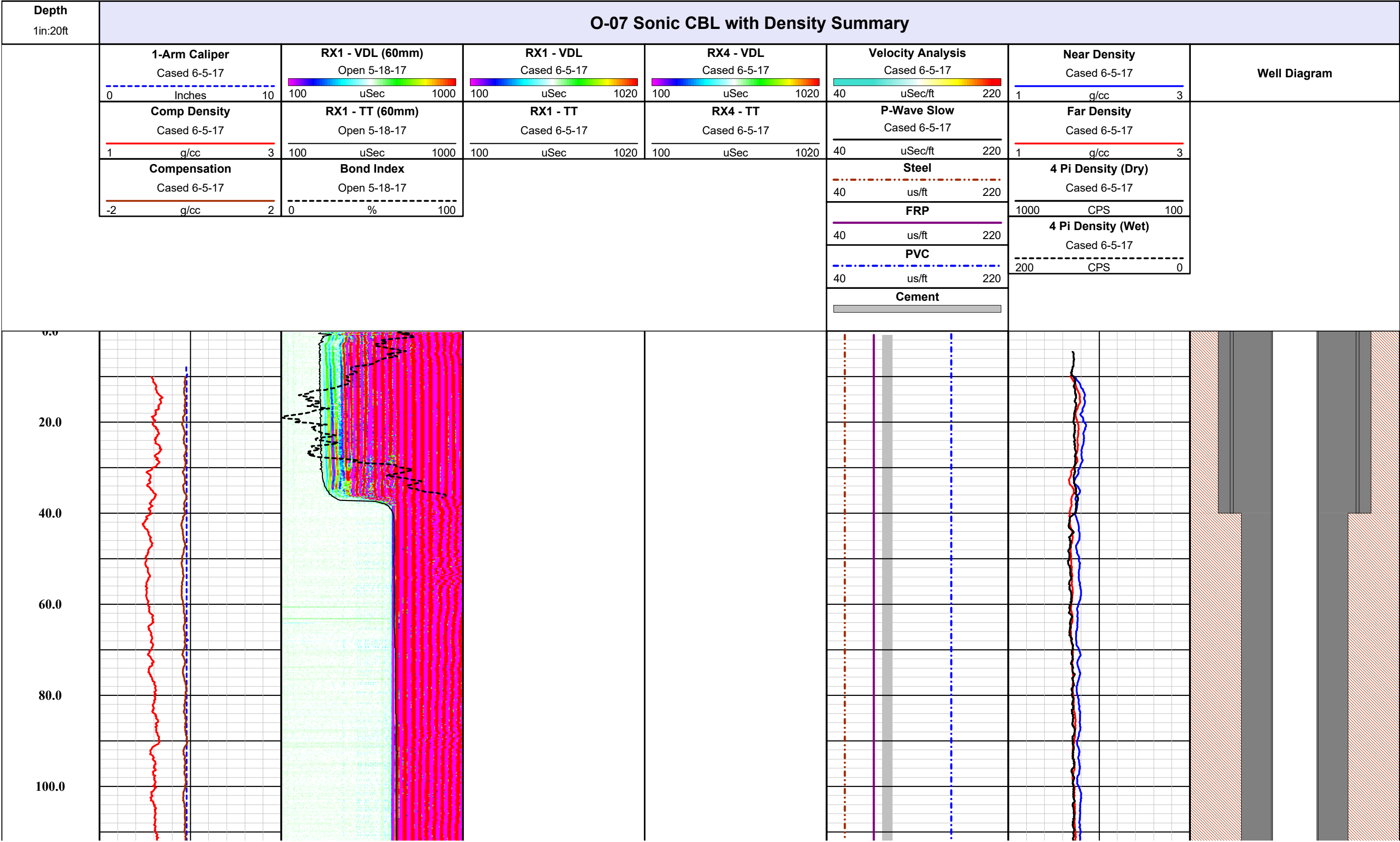


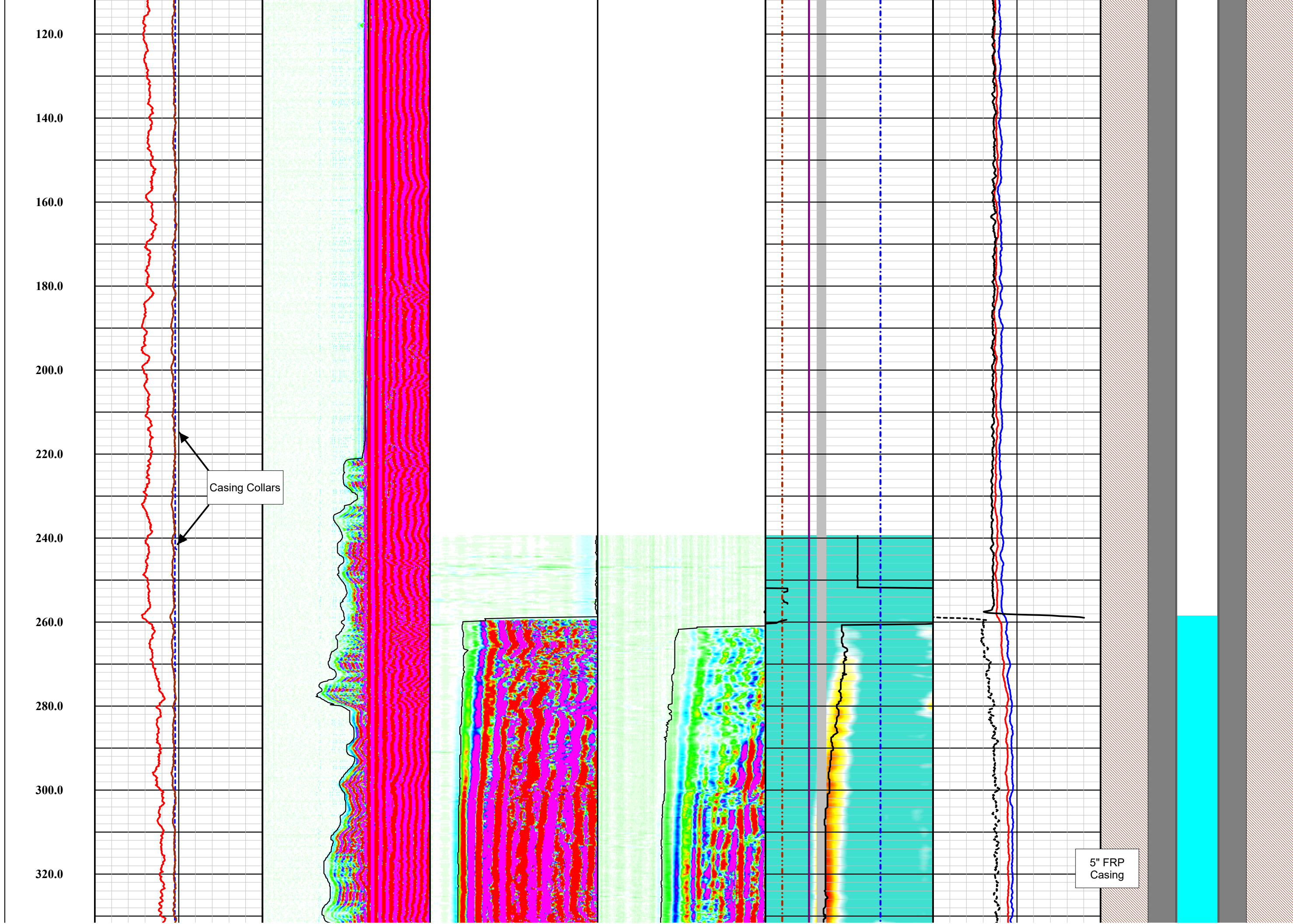
**Southwest Exploration Services, LLC**  
borehole geophysics & video services

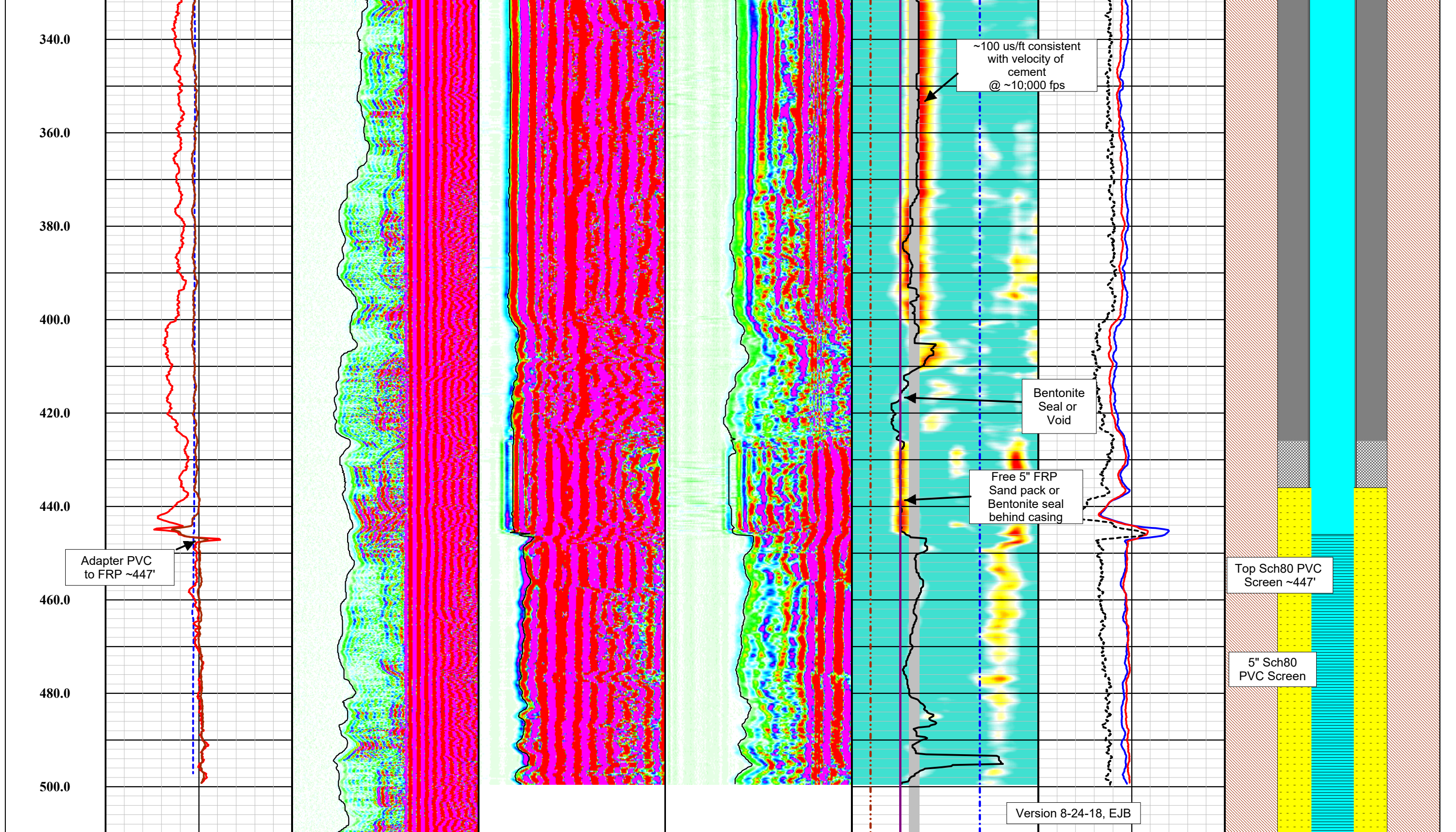


COMPANY: FLORENCE COPPER COMPANY  
FIELD: FLORENCE COPPER SITE  
WELL ID: O-07  
COUNTY: PINAL STATE: ARIZONA

Logging Engineer: VARIOUS  
Date Logged: VARIOUS  
Processed By: K.M / B.C.  
Date Processed: 08-24-18








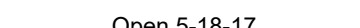
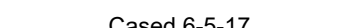
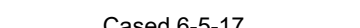
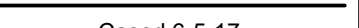
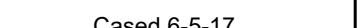
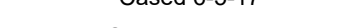
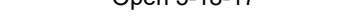
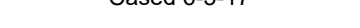
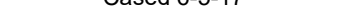
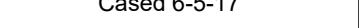
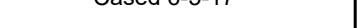
Version 8-24-18, EJB

-2	g/cc	2	0	%	100
Cased 6-5-17			Open 5-18-17		
Compensation			Bond Index		
1	g/cc	3	100	uSec	1000

100	uSec	1020	100	uSec	1020
-----	------	------	-----	------	------

Cement		
40	us/ft	220
PVC		
40	us/ft	220
FRP		
40	us/ft	220
Steel		
40	uSec/ft	220

200	CPS	0
Cased 6-5-17		
4 Pi Density (Wet)		
1000	CPS	100
Cased 6-5-17		
4 Pi Density (Dry)		
1	g/cc	3

	 Cased 6-5-17 <b>Comp Density</b>	 Open 5-18-17 <b>RX1 - TT (60mm)</b>	 Cased 6-5-17 <b>RX1 - TT</b>	 Cased 6-5-17 <b>RX4 - TT</b>	 Cased 6-5-17 <b>P-Wave Slow</b>	 Cased 6-5-17 <b>Far Density</b>	
	 Cased 6-5-17 <b>1-Arm Caliper</b>	 Open 5-18-17 <b>RX1 - VDL (60mm)</b>	 Cased 6-5-17 <b>RX1 - VDL</b>	 Cased 6-5-17 <b>RX4 - VDL</b>	 Cased 6-5-17 <b>Velocity Analysis</b>	 Cased 6-5-17 <b>Near Density</b>	<b>Well Diagram</b>
1in:20ft <b>Depth</b>	<b>O-07 Sonic CBL with Density Summary</b>						

## **APPENDIX G**

### **SAPT Documentation**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
STANDARD ANNULAR PRESSURE TEST

Operator FLORENCE COPPER, INC

State Permit No. P-101704

Address 1575 W. HUNT HWY

USEPA Permit No. R9UIC-AZ3-FY11-1

FLORENCE, AZ 85132

Date of Test 6/28/2017

Well Name O-07

Well Type CLASS III OBSERVATION

**LOCATION INFORMATION**

SE Quarter of the NW Quarter of the SW Quarter of Section 28; Range 9E; Township 4S; County PINAL;

Company Representative IAN REAM; Field Inspector LAUREN CANDREVA;

Type of Pressure Gauge with data logger inch face; 300 psi full scale; 0.001 psi increments;

New Gauge? Yes ☒ No ☐ If no, date of calibration            Calibration certification submitted? Yes ☐ No ☒

**TEST RESULTS**

Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells.

For Class II wells, annulus pressure should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure.

Original chart recordings must be submitted with this form.

5-year or annual test on time? Yes ☐ No ☒

2-year test for TA'd wells on time? Yes ☐ No ☒

After rework? Yes ☐ No ☒

Newly permitted well? Yes ☒ No ☐

Pressure (in psig)		
Time	Annulus	Tubing
8:17	120.34	same
8:27	120.04	same
8:37	119.82	same
8:47	119.64	same

Casing size 5" - NOMINAL

Tubing size 2"

Packer type INFLATABLE PACKER

Packer set @ 420.07

Top of Permitted Injection Zone 420

Is packer 100 ft or less above top of

Injection Zone? Yes ☒ No ☐

If not, please submit a justification.

Fluid return (gal.) 0.66

Comments: Pressure data collected by Level TROLL 400

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x 0.03 3.714 psi  
Test Period Pressure change 0.458 psi

Test Passed ☒ Test Failed ☐

If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

IAN REAM

Printed Name of Company Representative

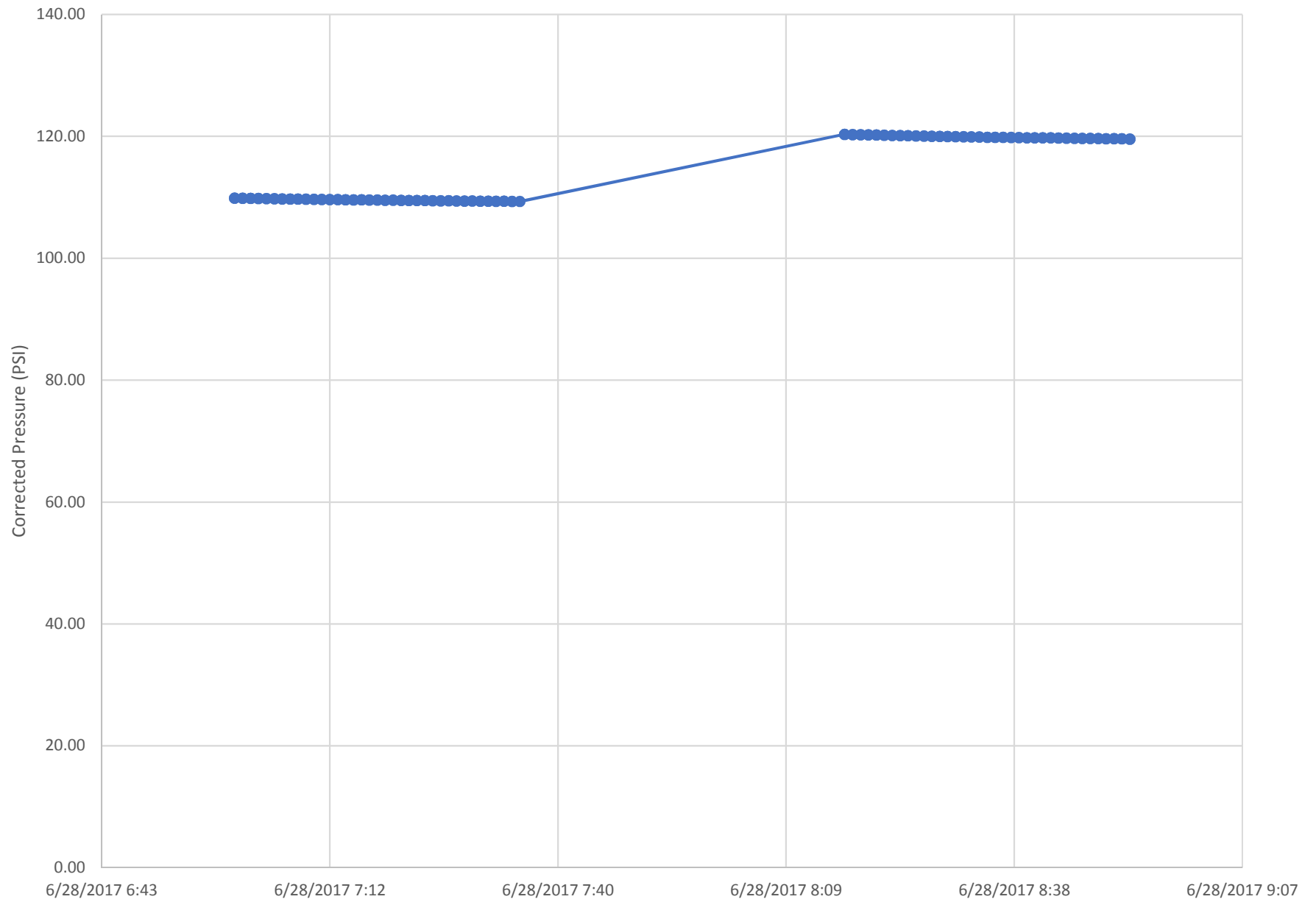


Signature of Company Representative

9-12-2018

Date

O-07 Standard Annular Pressure Test Data



<b>Well O-07 SAPT Data</b>		
Transducer Serial Number:	519257	
Transducer Model Number:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Pressure (PSI) (Sensor pressure - barometric pressure)
6/28/2017 7:00	123.81	109.84
6/28/2017 7:00	123.834	109.86
6/28/2017 7:01	123.826	109.85
6/28/2017 7:01	123.801	109.83
6/28/2017 7:02	123.791	109.82
6/28/2017 7:02	123.782	109.81
6/28/2017 7:03	123.77	109.80
6/28/2017 7:03	123.741	109.77
6/28/2017 7:04	123.749	109.77
6/28/2017 7:04	123.761	109.79
6/28/2017 7:05	123.744	109.77
6/28/2017 7:05	123.718	109.74
6/28/2017 7:06	123.706	109.73
6/28/2017 7:06	123.665	109.69
6/28/2017 7:07	123.686	109.71
6/28/2017 7:07	123.677	109.70
6/28/2017 7:08	123.672	109.70
6/28/2017 7:08	123.689	109.71
6/28/2017 7:09	123.661	109.69
6/28/2017 7:09	123.643	109.67
6/28/2017 7:10	123.625	109.65
6/28/2017 7:10	123.636	109.66
6/28/2017 7:11	123.615	109.64
6/28/2017 7:11	123.605	109.63
6/28/2017 7:12	123.586	109.61
6/28/2017 7:12	123.596	109.62
6/28/2017 7:13	123.582	109.61
6/28/2017 7:13	123.596	109.62
6/28/2017 7:14	123.572	109.60
6/28/2017 7:14	123.571	109.60
6/28/2017 7:15	123.565	109.59
6/28/2017 7:15	123.524	109.55
6/28/2017 7:16	123.551	109.58
6/28/2017 7:16	123.541	109.57
6/28/2017 7:17	123.525	109.55
6/28/2017 7:17	123.513	109.54
6/28/2017 7:18	123.521	109.55
6/28/2017 7:18	123.498	109.52
6/28/2017 7:19	123.493	109.52
6/28/2017 7:19	123.465	109.49
6/28/2017 7:20	123.47	109.50

<b>Well O-07 SAPT Data</b>		
Transducer Serial Number:	519257	
Transducer Model Number:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Pressure (PSI) (Sensor pressure - barometric pressure)
6/28/2017 7:20	123.504	109.53
6/28/2017 7:21	123.448	109.47
6/28/2017 7:21	123.462	109.49
6/28/2017 7:22	123.457	109.48
6/28/2017 7:22	123.432	109.46
6/28/2017 7:23	123.421	109.45
6/28/2017 7:23	123.436	109.46
6/28/2017 7:24	123.423	109.45
6/28/2017 7:24	123.435	109.46
6/28/2017 7:25	123.408	109.43
6/28/2017 7:25	123.408	109.43
6/28/2017 7:26	123.404	109.43
6/28/2017 7:26	123.38	109.41
6/28/2017 7:27	123.398	109.42
6/28/2017 7:27	123.385	109.41
6/28/2017 7:28	123.376	109.40
6/28/2017 7:28	123.355	109.38
6/28/2017 7:29	123.377	109.40
6/28/2017 7:29	123.331	109.36
6/28/2017 7:30	123.352	109.38
6/28/2017 7:30	123.356	109.38
6/28/2017 7:31	123.34	109.37
6/28/2017 7:31	123.336	109.36
6/28/2017 7:32	123.333	109.36
6/28/2017 7:32	123.315	109.34
6/28/2017 7:33	123.298	109.32
6/28/2017 7:33	123.31	109.34
6/28/2017 7:34	123.321	109.35
6/28/2017 7:34	123.314	109.34
6/28/2017 7:35	123.285	109.31
6/28/2017 7:35	123.294	109.32
6/28/2017 7:36	123.298	109.32
6/28/2017 8:17	134.313	120.34
6/28/2017 8:17	134.271	120.30
6/28/2017 8:18	134.262	120.29
6/28/2017 8:18	134.228	120.25
6/28/2017 8:19	134.216	120.24
6/28/2017 8:19	134.217	120.24
6/28/2017 8:20	134.217	120.24
6/28/2017 8:20	134.203	120.23
6/28/2017 8:21	134.179	120.20

<b>Well O-07 SAPT Data</b>		
Transducer Serial Number:	519257	
Transducer Model Number:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Pressure (PSI) (Sensor pressure - barometric pressure)
6/28/2017 8:21	134.167	120.19
6/28/2017 8:22	134.136	120.16
6/28/2017 8:22	134.135	120.16
6/28/2017 8:23	134.118	120.14
6/28/2017 8:23	134.102	120.13
6/28/2017 8:24	134.106	120.13
6/28/2017 8:24	134.077	120.10
6/28/2017 8:25	134.061	120.09
6/28/2017 8:25	134.071	120.10
6/28/2017 8:26	134.033	120.06
6/28/2017 8:26	134.015	120.04
6/28/2017 8:27	134.018	120.04
6/28/2017 8:27	134.01	120.04
6/28/2017 8:28	133.984	120.01
6/28/2017 8:28	133.963	119.99
6/28/2017 8:29	133.97	120.00
6/28/2017 8:29	133.939	119.96
6/28/2017 8:30	133.943	119.97
6/28/2017 8:30	133.925	119.95
6/28/2017 8:31	133.911	119.94
6/28/2017 8:31	133.899	119.92
6/28/2017 8:32	133.9	119.93
6/28/2017 8:32	133.88	119.91
6/28/2017 8:33	133.872	119.90
6/28/2017 8:33	133.868	119.89
6/28/2017 8:34	133.845	119.87
6/28/2017 8:34	133.868	119.89
6/28/2017 8:35	133.818	119.84
6/28/2017 8:35	133.811	119.84
6/28/2017 8:36	133.809	119.83
6/28/2017 8:36	133.788	119.81
6/28/2017 8:37	133.79	119.82
6/28/2017 8:37	133.802	119.83
6/28/2017 8:38	133.785	119.81
6/28/2017 8:38	133.753	119.78
6/28/2017 8:39	133.762	119.79
6/28/2017 8:39	133.76	119.79
6/28/2017 8:40	133.741	119.77
6/28/2017 8:40	133.724	119.75
6/28/2017 8:41	133.723	119.75
6/28/2017 8:41	133.713	119.74

<b>Well O-07 SAPT Data</b>		
Transducer Serial Number:	519257	
Transducer Model Number:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Pressure (PSI) (Sensor pressure - barometric pressure)
6/28/2017 8:42	133.711	119.74
6/28/2017 8:42	133.712	119.74
6/28/2017 8:43	133.72	119.75
6/28/2017 8:43	133.705	119.73
6/28/2017 8:44	133.695	119.72
6/28/2017 8:44	133.666	119.69
6/28/2017 8:45	133.66	119.69
6/28/2017 8:45	133.674	119.70
6/28/2017 8:46	133.652	119.68
6/28/2017 8:46	133.635	119.66
6/28/2017 8:47	133.616	119.64
6/28/2017 8:47	133.631	119.66
6/28/2017 8:48	133.613	119.64
6/28/2017 8:48	133.628	119.65
6/28/2017 8:49	133.599	119.62
6/28/2017 8:49	133.596	119.62
6/28/2017 8:50	133.579	119.60
6/28/2017 8:50	133.573	119.60
6/28/2017 8:51	133.594	119.62
6/28/2017 8:51	133.553	119.58
6/28/2017 8:52	133.558	119.58
6/28/2017 8:52	133.553	119.58
6/28/2017 8:53	133.526	119.55
6/28/2017 8:53	133.495	119.52

## **APPENDIX H**

### **Well Development Field Forms**

# PUMPING TEST/DEVELOPMENT FIELD DATA LOG

Project Name: FCI	Project No.: 129687
Well No.: 0-07	Date: 5-24-17
Location:	Measuring Point:
Total Depth of Well (ft bls): 1200	Screen Interval (ft bls): 746 - 1200
Pump Setting (ft bls): 1180	Pump Type: AIR LIFT
How Q Measured: Volume in Tub 4WL	Personnel: C. GUST

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ml/L)	pH	Sp. Cond. (mmhos/cm)	Temp. °F	Comments
930				1				START AIR LIFT
1000				1.5				DK BROWN / MUD
1030								DK BROWN / MUD
1100				0.1				BROWN / CLOUDY
1130 ~70				20.1				TAN / CLOUDY
1200				20.1				TAN / CLOUDY
1230				20.2				TAN / CLOUDY
1300				20.1				Light Tan / Cloudy
1300								AIR LIFT OFF
1400								AIR LIFT ON
1400				20.1				TAN / CLOUDY
1500				0.1				Light Tan / Cloudy
1530				20.1				CLOUDY / MILKY
1600				20.1				CLOUDY / MILKY
1630				0				MILKY / CLEAR
1730				0				MILKY / CLEAR
1745								AIR LIFT OFF
0815 ~70				0.2				AIR LIFT ON light Brown
0825 ~50								BROWN / MUD
0845								BROWN / MUD
0930 ~70				0.1				Light Brown / MUD
1000 ~70				20.1				Light Brown / MUD
1100 ~70				20.1				TAN / CLOUDY
1200 ~70				0				MILKY NTU 71-9
1300 ~70				0				MILKY / CLEAR NTU 346
1305								END AIR LIFT
Additional Comments: AQUA CLEAR INJECTED / SWAGED IN MORNING 5-25-17								

## PUMPING TEST/DEVELOPMENT FIELD DATA LOG

Project Name: FCI	Project No.: 129687
Well No.: 0-07	Date: 5-27-17
Location:	Measuring Point: to 20" ALS
Total Depth of Well (ft bls): 1200	Screen Interval (ft bls):
Pump Setting (ft bls): 1195	Pump Type: GRIND FOR
How Q Measured: Buckets / stopwatch	Personnel: C. (11.51)

[illegible]

# PUMPING TEST/DEVELOPMENT FIELD DATA LOG

Project Name: <u>FCI</u>	Project No.: <u>129687-005</u>
Well No.: <u>0-07</u>	Date: <u>5-31-17</u>
Location:	Measuring Point:
Total Depth of Well (ft bls): <u>1195</u>	Screen Interval (ft bls):
Pump Setting (ft bls): <u>1190', Grundfos M5400</u>	Pump Type:
How Q Measured: <u>Stopwatch</u>	Personnel: <u>C Price</u>

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ml/L)	pH	Sp. Cond. (mmhos/cm)	Temp. °F	Comments
0630								pump on Geo @ drill rig.
								INTU
1630	43	271.62		0				0.60
1637	43	271.65		0	6.56	1629	29.4	clear 1.02
1645	43	271.68		0	6.78	1637	29.3	clear 0.64
1700	43	271.73		0	6.93	1641	29.2	clear 0.64
1715	43	271.79		0	7.00	1658	28.7	clear 0.65
1735	43	271.88		0	7.12	1640	28.8	clear 0.72
1757								pump off
<hr/>								
0618		260.65						pump on
0620	43	267.96		0	7.67	1799	29.6	cloudy 116
0623	43	268.48		0	7.56	1792	29.1	clear 12.7
0630	43	268.94		0	7.52	1715	28.6	clear 5.80
0635	43	269.20		0	7.48	1700	28.4	clear 4.82
0640	43	269.38		0	7.46	1699	28.4	clear 2.68
0645	43	269.60		0	7.46	1693	28.4	clear 1.64
0647								pump off
0720		261.18		0				pump on
0722	43	268.41		0	7.47	1686	27.8	clear 6.07
0725	43	268.80		0	7.44	1725	29.2	clear 11.0
0732	43	269.20		0	7.45	1686	28.7	clear 3.44
0740	43	269.58		0	7.44	1670	28.5	clear 3.81
0750	43	269.93		0	7.44	1669	28.5	clear 2.02
0752								pump off
<hr/>								
Additional Comments:								

## PUMPING TEST/DEVELOPMENT FIELD DATA LOG





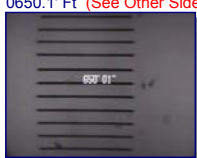




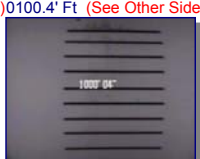


Project Name: FCI	Project No.: 12068-005
Well No.: 0-07	Date: 6-1-15
Location:	Measuring Point:
Total Depth of Well (ft bls): 1105	Screen Interval (ft bls):
Pump Setting (ft bls): 1120', Grnd Foe MS4000	Pump Type:
How Q Measured: Stopwatch	Personnel: C Price

[illegible]

## **APPENDIX I**

### **Well Video Log**

Client: **Florence Copper** Survey Date: **June 05, 2017**  
 Address: **1575 W. Hunt Hwy** Invoice: **7975** Run: **1**  
 City: **Florence** State: **Az** Zip: **85132** Well Name: **O-07**  
 Requested By: **Florence Copper** P.O.: \_\_\_\_\_ Well Owner: **Florence Copper**  
 Copy To: **Florence Copper** Camera: **1 5/8" Color Camera**  
 Reason For Survey: **General Inspection** Zero Datum: **Ground Level**  
 Location: **Florence Copper** Depth: **1200 Ft** Vehicle: **290**  
 Field: **Florence Copper**  
 Csg. I.D.@ Surface **5.25 In.** I.D. Reference: **Measured** Casing Buildup: **None**  
 Operator: **Don Eckman** Lat.: \_\_\_\_\_ Long.: \_\_\_\_\_ Sec: \_\_\_\_\_ Twp: \_\_\_\_\_ Rge: \_\_\_\_\_

Wellbore Snapshots	True Depths: (SideScan-Feet)	WELLBORE / CASING INFORMATION
0009.3' Ft (See Other Side) 0447.1' Ft (See Other Side)  	9.3'	Zereoed side view at ground level.
	259.3'	Inspected several casing joint during survey. All appear to be in good condition.
	446.10'	Top of fiberglass casing.
0500.0' Ft (See Other Side) 0600.1' Ft (See Other Side)  	1180'	Static water level. Visibility good.
	1194'	Top of PVC horizontal slot perforations. Appear to be open.
		Minor bio fouling.
0650.1' Ft (See Other Side) 0700.0' Ft (See Other Side)  		Bottom fill. End of survey.
0800.4' Ft (See Other Side) 0900.4' Ft (See Other Side)  		
0950.9' Ft (See Other Side) 0100.4' Ft (See Other Side)  		
1179.0' Ft (See Other Side) 1182.0' Ft (See Other Side)  		

Notes:

## 12 WELLBORE SHAPSHOTS

0009.3' Ft (Enlargement)



0447.1' Ft (Enlargement)



0500.0' Ft (Enlargement)



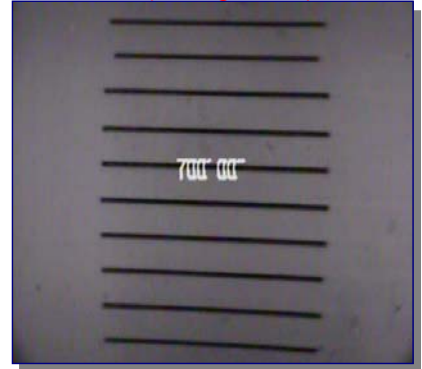
0600.1' Ft (Enlargement)



0650.1' Ft (Enlargement)



0700.0' Ft (Enlargement)



0800.4' Ft (Enlargement)



0900.4' Ft (Enlargement)



0950.9' Ft (Enlargement)



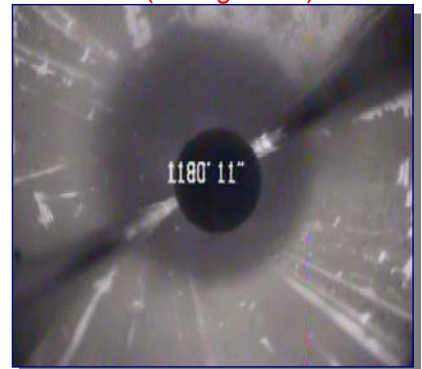
0100.4' Ft (Enlargement)



1179.0' Ft (Enlargement)



1182.0' Ft (Enlargement)





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